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Technical Report No. 81-2

The Relationship Among Sea Surface Roughness Variations, Oceanographic Analyses, and Airborne Remote Sensing Analyses

by

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and

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**Prepared for NASA—Langley Research
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DEPARTMENT OF OCEANOGRAPHY
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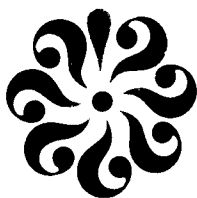
Final Report

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THE RELATIONSHIP AMONG SEA SURFACE ROUGHNESS VARIATIONS,
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INTRODUCTION

Background and Purpose

Imaging radars are active devices that sense the environment with short-wavelength electromagnetic waves. As active sensors, radars provide their own illumination in the microwave region of the electromagnetic spectrum and thus are not affected by diurnal changes in emitted or reflected radiation from the Earth's surface. Side-looking radars (SLAR's) utilize the Doppler history (change of phase) associated with the motion of the aircraft and record both the phase and the amplitude of the backscattered energy. Synthetic aperture radar (SAR) is a coherent airborne or spaceborne radar that uses the motion of a moderately broad physical antenna beam to synthesize a very narrow beam that provides high resolution along track. A lack of sufficient "sea truth" data makes it impossible to completely explain large backscatter (σ_0) differences in SEASAT-SAR data obtained from adjacent surface water. Low σ_0 areas may be produced by calm (lack of surface wind) and slick areas, whereas high (σ_0) may be produced by gravity waves and other surface roughness phenomena. Some backscatter differences may be caused by ocean fronts that illustrate both increased and decreased zones of roughness.

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The purpose of the October 7-9, 1980 Fronts experiment was to ascertain whether the SAR is able to image large-scale estuarine and oceanic features such as fronts and to explain the electromagnetic interaction between SAR and the individual surface front features. The oceanographic objective of the investigation was to interpret temporal and spatial surface layer phenomena associated with estuarine fronts in order to gauge the significance of frontal features observed in SEASAT and airborne SAR and SLAR imagery. The objectives included both the examination of frontal features to resolve the causes of the observed patterns in the radar scenes as well as interpretation of these images to assess the potential importance of SAR and SLAR imagery to oceanographers engaged in various disciplines requiring information on mixing.

To better understand the study's mission, we must define the significance of fronts and mixing and how they relate to our study area in the Chesapeake Bay. Water masses from upper Chesapeake Bay, the York River, the James River, and the Atlantic Ocean converge at the entrance to the Bay. The mixing of these water masses is inhibited by boundary conditions called "fronts." Fronts that are commonly observed in the bay entrance are sometimes accompanied by visible foam lines, slicks, or "peculiar" capillary ripples (fig. 1), but little is known about their stability or temporal and spatial distribution. The maintenance of estuarine fronts is closely influenced by the lateral shear across the frontal interface (ref. 1). Frontal type shear between water masses also may result from variations in bathymetry and tidal flow.

The entrance waters on the north side of the Bay are influenced by three channels and three shoals. During specific stages of the tide this

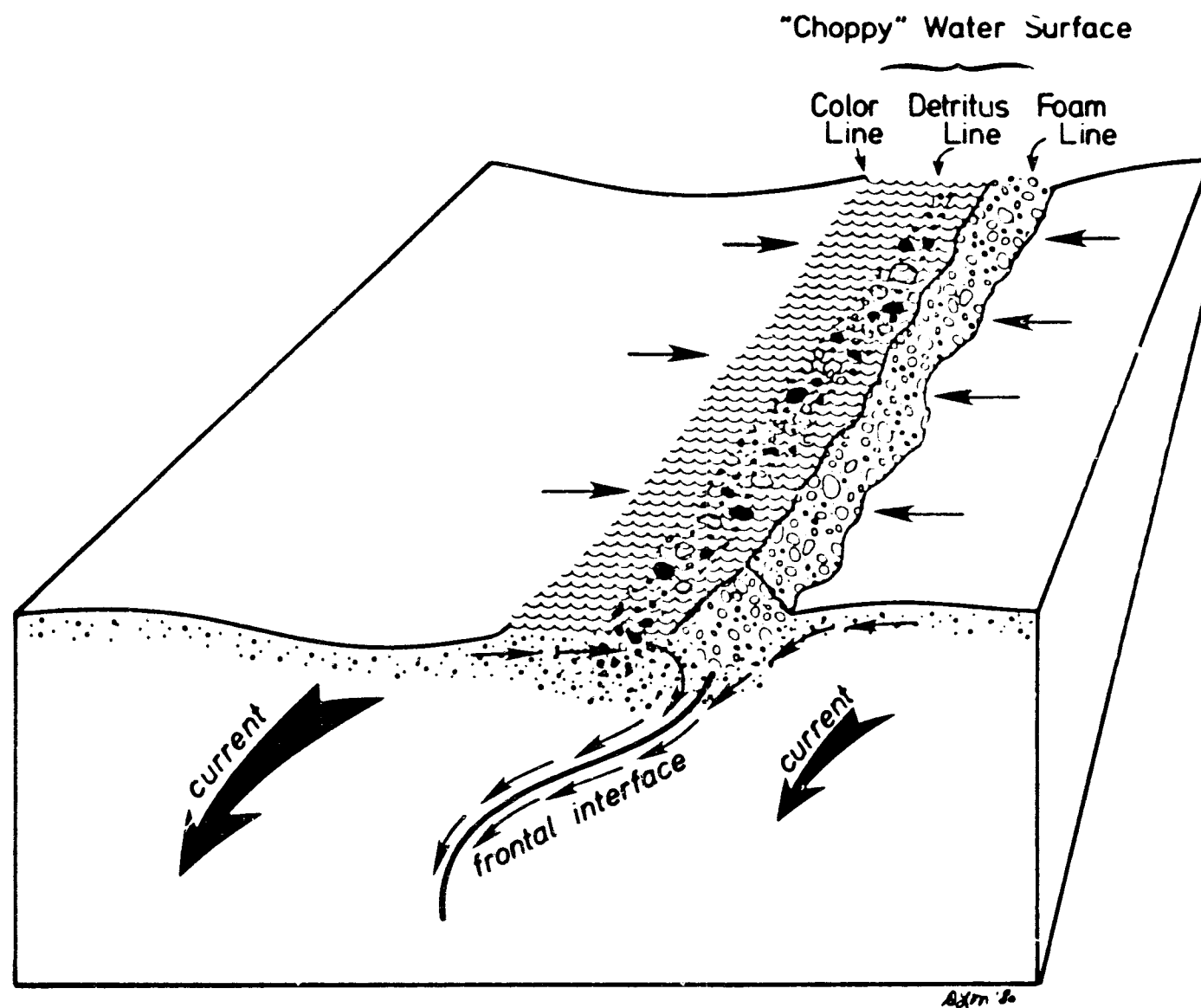


Figure 1. Schematic diagram of a frontal system illustrating convergent surface currents.

influence results in the temporary development of frontal boundaries. Convergent surface currents at fronts are effective in accumulating and compressing buoyant particulate and dissolved matter (fig. 1). The calm areas adjacent to fronts are caused by the accumulation and compression of hydrocarbons and surface active materials. Garrett (ref. 2) determined that if surface active organic materials are compressed (at the sea surface) with a force of 0.5 to 1.0 dyne/cm, they form a "slick" capable of damping capillary waves. Pressures that have been identified as being capable of compacting surface active materials include langmuir circulation (refs. 3,4), internal waves (ref. 5), wind stress against a barrier (ref. 6), the discharge of a river into the sea (refs. 7-10), and thermo-haline gradients (refs. 11-13).

Location and Oceanographic Sampling Scheme

The experiment was conducted at the entrance to the Chesapeake Bay where fronts were observed to occur on a somewhat regular basis. Two interactive elements of the experiment involved airborne measurements and oceanographic measurements. The airborne effort consisted of data collection by synthetic aperture radar (SAR) housed in U.S. Marine F-4 aircraft and real aperture SLAR in U.S. Army Mohawk aircraft. Four flight lines for the October mission at the Chesapeake Bay entrance are shown in figure 2. The NASA/Wallops aircraft P-3 was a multi-instrumental vehicle that flew repetitive flights across five transect lines in the Bay entrance area (fig. 3). A total of 89 transects were flown during the October 7-9, 1980 Fronts experiment. A variety of sensors were used to evaluate surface roughness and

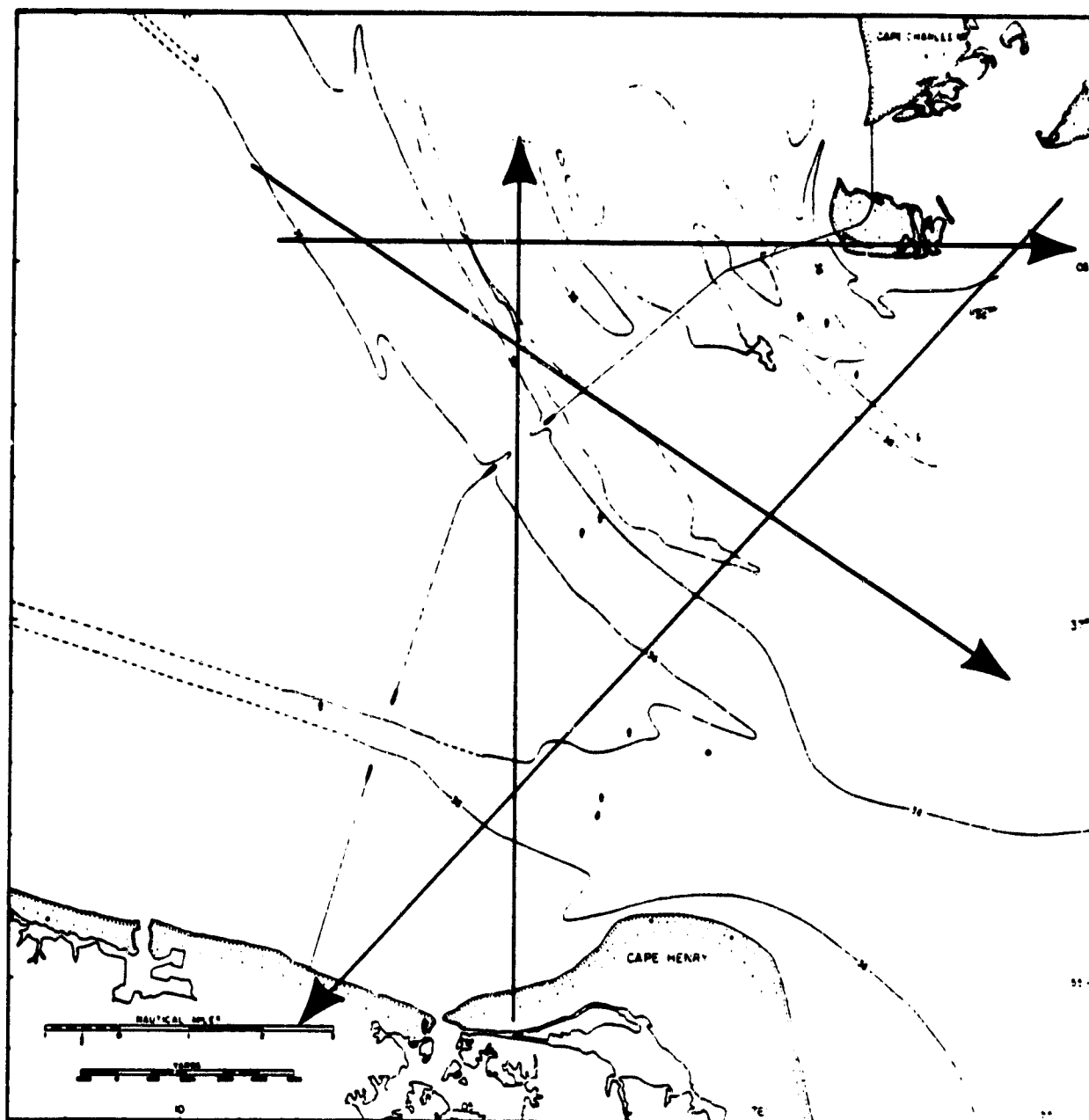


Figure 2. SAR flight lines.

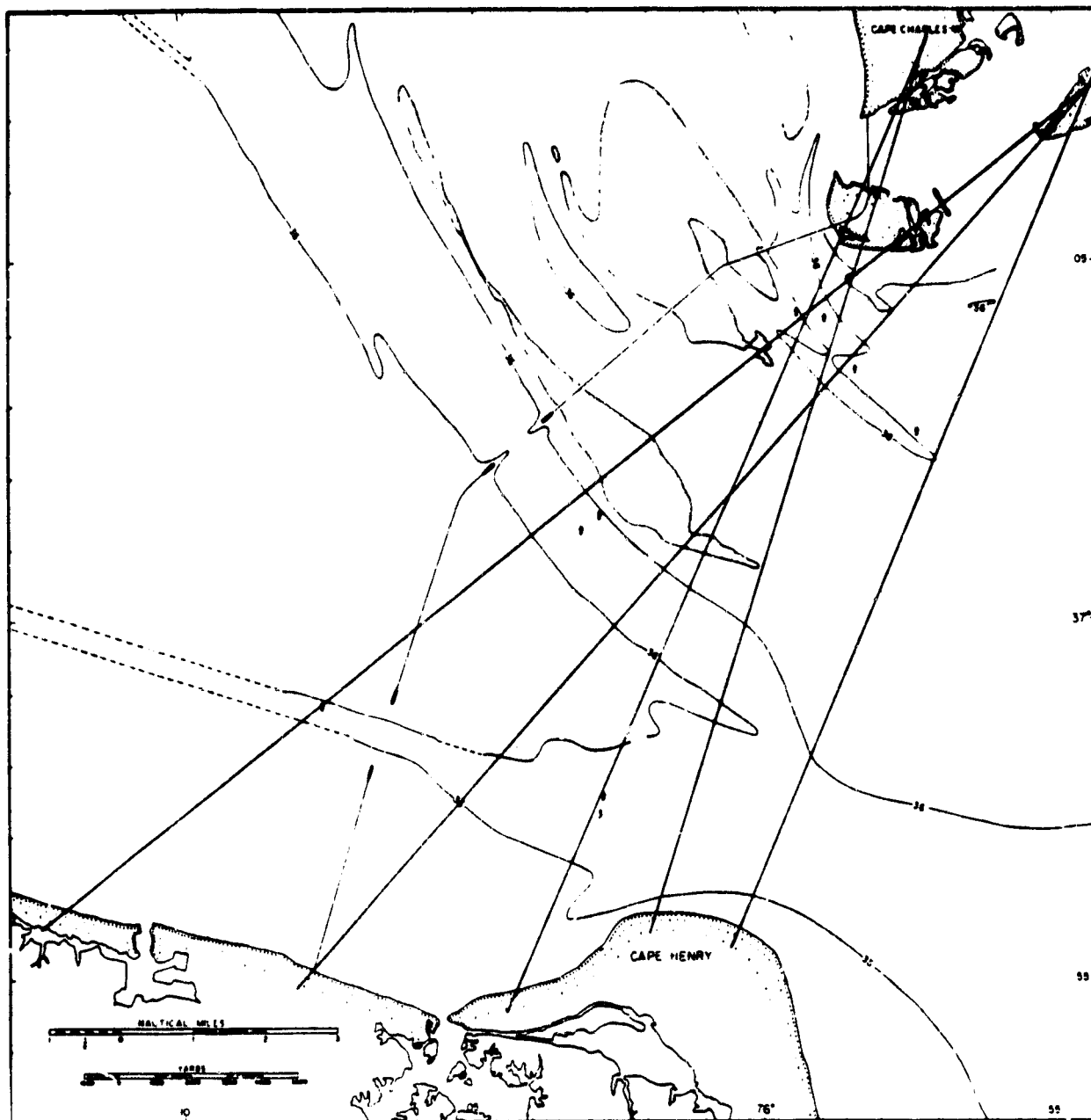


Figure 3. NASA/Wallops P-3 aircraft flight lines.

color as well as temperature and salinity. Instruments housed on the NASA/Wallops P-3 aircraft included:

1. a Doppler scatterometer,
2. a 13.9-GHz scatterometer,
3. an L-band radiometer,
4. airborne oceanographic lidar (AOL),
5. surface contour radar (SCR),
6. a PRT-5,
7. both vertical and side-looking video cameras.

The involvement of the Department of Oceanography at Old Dominion University included:

1. experimental design,
2. oceanographic data collection,
3. analyses of oceanographic data,
4. editing of 35-mm and video data, and
5. registration of visually observed fronts.

The oceanographic data collection involved aspects of chemical, physical, and geological oceanography.

• Cross-frontal surveys (coincident with data collection flights) were made of water column characteristics that have a potential impact on surface roughness. Of particular interest was the relationship between suspended solids and surface active materials and hydrocarbons. Samples collected along the transects were analyzed for:

1. total suspended matter (TSM),
2. total suspended organics (TSO),

3. total suspended inorganics (TSI),
4. particle shape and surface area (PSSA),
5. particle size distributions (PSD),
6. dissolved hydrocarbons (DH),
7. absorbed hydrocarbons (AH),
8. particulate organic carbon (POC),
9. dissolved organic carbon (DOC),
10. total organic carbon (TOC),
11. chlorophyll-a,
12. surface tension,
13. temperature,
14. salinity, and
15. horizontal current.

Frontal shear and convergence flow were obtained by tracking neutrally buoyant drifters with both a Loran-C equipped boat and a camera-equipped helicopter. The sampling scheme provided registration for the airborne experiments and samples were taken to analyze the chemical and physical parameters that may influence water surface roughness at water mass boundaries. Sampling was conducted during a four-hour interval each day, which bracketed the period of maximum ebb velocity and outwelling of Chesapeake Bay water. During the three-day experiment the R/V Linwood Holton and two support boats analyzed six different fronts in the entrance to the Chesapeake Bay. The R/V Linwood Holton collected data 30 to 50 m to the left and right of each front. Eight oceanographic measurements were made at depths throughout the water column, and water samples were taken to conduct an additional eight or nine different analyses on each sample. One of the

support boats followed a similar sampling pattern with the addition of samples taken at the frontal boundary. However, only surface microlayer samples were collected. The second support boat worked with a helicopter to make convergence and shear measurements at frontal boundaries. The boat released a line of cards across the front and the helicopter recorded their position and relative spacing by Loran C and photography, respectively. The magnitudes of convergent flow and shear across fronts were measured to determine the relative strengths of fronts. Surface microlayer samples were of particular importance for estimating increases in the concentration of surface active materials. Surface tension, which is decreased by an increase of the surface active fraction of total organic carbon (TOC), was determined because of its relationship to slick formation and wave dampening.

Measurement of total organic carbon (TOC) and surface tension lowering in selected frontal zones indicates that surface active organic materials are present at the air-sea interface. Also, general increases of TOC and surface tension lowering closer to the frontal interface indicate that compressional forces associated with frontal systems are concentrating surface active organic materials and that slicks are sometimes formed. The presence of slicks caused by hydrocarbons and surface active materials affects the surface wave field, which may also influence radar backscatter (ref. 14). Although a variety of surface phenomena and combinations of surface phenomena are often described as fronts, prominent frontal boundaries generally have foamlines and increased roughness caused by capillary ripples. Less prominent frontal boundaries had linear zones of "slick" water surface. The mere presence of a slick, color, or turbidity change does not always indi-

cate the presence of a true dynamical front (i.e., water mass boundaries illustrating shear and convergence).

In all, 2,000 analyses were conducted to characterize the spatial and temporal variabilities associated with water mass boundaries.

Suspended solids were filtered onboard ship immediately following sample collection using Gelman type A/E glass fiber filters that had been prewashed, pre-ignited and preweighed. Filters were weighed on a Mettler balance to an accuracy of 0.1 mg. Microscopic analysis of each filter was performed to determine the absence or relative abundance of each of the 25 most prominent particle types. Concentrations of TSO and TSI were determined by weight loss after ignition of the filters for 2 hr at 400° C.

Particle size analysis was done within 24 hr of collection using a Model TA II Coulter Counter. Each sample was analyzed for 150 s using a 400 μ m aperture tube that provided a size range of 5 to 200 μ m. Each analysis produced a size distribution histogram, a total count of particles, and a percent volume of the total population for each of 16 different size classes.

Chlorophyll-a samples were filtered onboard ship and then wrapped in foil and stored at -5° C. Samples obtained for TOC determination were also stored at -5° C until analysis could be completed.

An Endeco current meter was used to obtain current speed and direction, temperature, and salinity measurements at each station.

The ODU-1 collected microlayer and subsurface water samples from stations located on either side of each front. Microlayer samples were taken using a 16-mesh stainless steel screen developed by Garrett (ref. 15) which effectively samples the top 150 to 300 μ m of the sea surface. Subsurface

samples were taken by immersing a 500 ml Erlenmeyer flask approximately 20 cm below the surface.

Surface tension was measured by the spreading drop technique (ref. 16). Single drops of oil (of decreasing surface tension) were released onto the H₂O surface until the drop just spread against the in situ film pressure.

Measurements of convergence and shear in the frontal region were accomplished by releasing numbered drifter cards from the Osprey and tracking the position of the cards in both a relative and absolute manner. Tracking was made with Loran C and photography from a hovering helicopter. Surface bucket samples were taken when the drifter cards were retrieved. Water samples from the ODU-1 and Osprey were returned to the Holton for analysis.

DATA DESCRIPTION

In all, 12 features with frontal characteristics were observed in the northern part of the Chesapeake Bay entrance (fig. 4).

Salinity gradients across boundaries ranged from 0 ‰ per 50 m to 4.0 ‰ per 50 m. Data from six different frontal boundaries were analyzed; however, only one front generally illustrated a high salinity gradient with partially stratified water south of the boundary and mixed water north of the boundary. Other fronts that had weak salinity gradients had a wide range of turbidity gradients, surface tension depression, and convergence and shear characteristics. These fronts appeared to be spatially and temporally controlled by bathymetry and tidal currents, respectively. During the study period, the salinity front was generally associated with the Nine-Foot Shoal South (NFSS) front. However, during other periods of the year it was observed farther to the south. Bathymetrically controlled fronts gener-

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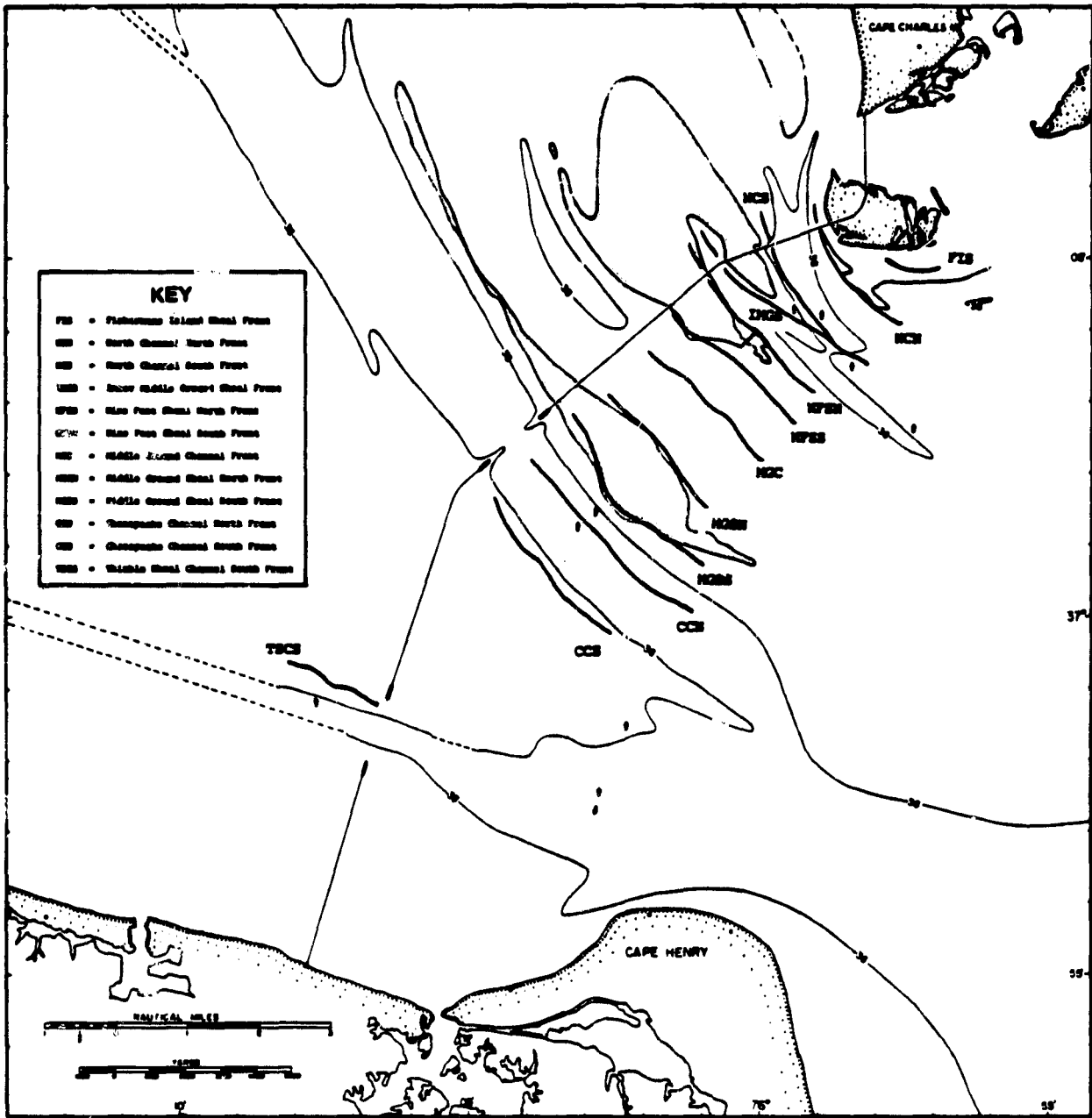


Figure 4. Front locations.

ally evolved at the margins of channels or shoals during the maximum speeds of the ebbing tide. Since the tidal wave at the entrance to the Chesapeake Bay is a progressive wave, the maximum speeds approximately corresponded to the periods of high and low water, and bathymetrically controlled fronts generally only occurred within several hours of high or low water. The stability or strength of a frontal boundary was estimated by the magnitude of the shear across the boundary and the magnitude of convergent flow. Fronts with strong dynamic boundaries had illustrated narrow bands of rough water, whereas weak fronts had only foam or slick zones. Some of these surficial phenomena were not associated with true dynamical fronts (i.e., water mass boundaries illustrating shear and convergence); however, the distinction between fronts and "false" fronts may be an important result of this experiment.

Table 1 is a matrix of surface characteristics associated with fronts of varying intensity. Note that turbidity differences, which are often used as an indication of coastal and oceanic fronts, are not valid for identifying the salinity front (NFSS-281) or strong dynamic fronts.

Convergent currents are particularly important in this experiment because they may collect hydrocarbons and surface active organic complexes. These materials produce decreases in the surface tension that may dampen capillary waves or even produce slick areas. Since these roughness characteristics relate to the presence and strength of fronts, then measurements of roughness gradients may be a useful way of distinguishing dynamic fronts from nondynamic turbidity gradients. On October 7, 1981, the Nine-Foot Shoals South front and Inner Middle Grounds Shoals front had strong convergent currents (25-42 cm/s), well developed slick zones, and significant

values for surface tension depression between the bordering water masses and the frontal zone. On October 8, 1980, the Nine-Foot Shoals South front had moderate convergent currents (17 cm/s), modest surface pressure lowering, no apparent slick zone, but a well-developed zone of "chattering" ripples.

Turbidity gradients associated with fronts were generally dependent on the resuspension of material from shoal areas rather than form a "buoyant" plume of Bay water outwelling into shelf water. Since turbidity is dependent to a large extent on a nonconservative quality of water (i.e., suspended particulate material), a local source is required to produce a cross-frontal gradient. Six of the nine fronts analyzed during the mission had a sufficient source of suspended particulate material to produce a turbidity gradient. Two and possibly three of these fronts were actually "false" fronts: that is, they did not have shear and convergent characteristics of a dynamic front.

Table 1. Surface Characteristics of Bay entrance fronts.

Ripple	Slicks	Foam & Detritus	Δs	ΔT	ΔV (cm/s)		Front Movement Direction	Δ TSM	Δ Trans.	(ODUT) Δ TOC	(ODUT) Δ Surface Tension Lowering	Tidal Hour	Name of Front	Classification	Front Trend
					Shear	Converge									
X	X	X	1.4	0.5	6R	42 same	ND	0.2	10	ND	ND	-3	CNN 281	Bathymetric Front	285
X	X	X	3.6	0.2	40R	25 L	NE	9.7	34	0.9	13-19	-1	NFSS 281	Complex Front	120
Very Weak Differential Roughness	X	X	1.1	0.4	22R	29 L	ND	13.3	23	7.4	9-15	LW	TMGS 281	Turbidity Front	130
X	X	X	0.0	0.0		--	ND	1.8	1	ND	6-13	+1.5	CCN 281	Kellett Slick Front	135
-- (Only	-- Turbidity	-- Change)	1.1	0.4		--	NE	3.7	7	1.6	0-5 (-)	-3	MGSS 282	Turbidity False Front	135
X Strong	--	--	1.4	0.1	24R	17 L	S	8.1 L	20	ND	0-5	-1.5	NFSS 282	Complex Front	110
X Strong	--	--	0.7	0.1	19R	17 L	S	2.8 L	1.0	ND	0-5	-1	NFSS 282	Bathymetric Front	110
X Weak	--	X Traces	0.7	0.1		--	N	12.6	17	ND	0-0	LW	TMGS 282	Turbidity False Front	140
X Stronger	--	X Well Developed	0.7	0.3		--	Very Slow Northerly Movement	25.2	11	ND	0-5	+1	TMGS 282	Bathymetric Front	135
					6	31		2.4				LW	NFSN-28	Bathymetric Front	

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The Appendixes to this report represent all oceanographic data collected during the three-day Fronts mission, plus all edited notes of the 35-mm and closed-circuit television data from the flight lines of the Wallops P-3 aircraft.

APPENDIX A

OCEANOGRAPHIC DATA COLLECTED DURING THE FRONTS MISSION

This appendix contains the geophysical, physical, and chemical data collected by the R/V Linwood Holton and the support boats ODU-1 and Osprey.

Chesapeake Channel North		10-07-80	MLW 1410										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/l)	TSI (mg/l)	TSO (mg/l)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT x 10 ⁻⁴
Holton	L-S	37° 01.98'	76° 03.22'	1055	29.5	19.5	5.8	4.8	1.0	16.9	20-25		29.2
	L-1				29.5	19.5	6.0	-	-	-	20-25	8-10	38.9
	L-3				29.9	19.4	10.4	8.6	1.8	17.5	20-25	8-10	37.8
	L-B				30.6	19.3	15.7	14.2	1.5	9.6	20-25	8-10	28.3
ODU-1	L	-	-	1046	-	-	5.5	4.2	1.3	23.6	20-25	8-10	32.0
Osprey	L ₃	37° 01.83'	76° 03.41'	1122	-	-	3.4	2.3	1.1	32.4	20-25	64-80	21.2
	L ₂	37° 01.83'	76° 03.41'		-	-	2.6	1.6	1.0	38.5	50-64	20-25	24.2
	L ₁	-	-		-	-	3.0	1.9	1.1	36.7	20-25	8-10	30.1
Holton	R-S	37° 01.87'	76° 03.12'	1142	30.9	20.0	6.0	4.3	1.2	20.0	20-25	64-80 ^a	21.1
	R-1				30.9	20.0	6.9	5.9	1.0	14.5	20-25	8-10 ^a	30.2
	R-3				30.9	19.7	9.7	8.5	1.2	12.4	20-25	8-10	23.7
	R-B				30.9	19.5	11.1	10.0	1.2	10.7	8-10	20-25	41.9
ODU-1	R	-	-	1057	-	-	7.6	4.8	2.8	36.8	20-25	8-10	36.2
Osprey	R ₃	37° 02.06'	76° 03.36'	1118	-	-	4.5	3.5	1.0	22.2	20-25	8-10 ^b	32.4
	R ₂	37° 02.03'	76° 03.46'		-	-	9.0	7.9	1.1	12.1	20-25		34.7
	R ₁	37° 02.06'	76° 03.52'		-	-	8.2	5.6	2.6	31.1	20-25	8-10 ^c	32.5

* On this and the tables which follow, L = left, R = right, and the second letter or number is a depth indicator - S = surface, B = bottom, 1, 2, 3 = 1, 2, or 3 m.

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10-07-80 MLW 1410

Chesapeake
Channel North

		TOC (mg/l)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	3.9	11.6	2.0		66	4.1	.17	.34	.17	10.3	137
	L-1	2.9	4.3	1.7							10.3	137
	L-3	4.1	2.9	1.0							20.6	315
	L-B	3.0	3.3	1.1							25.7	325
ODU-1	L-m1	6.1	3.8	3.4	6-12							
	L-ss	-	4.8	1.5								
Osprey	L ₃		4.1	3.0								
	L ₂		3.6	0.8								
	L ₁		4.6	1.1								
Holton	R-S	-	2.8	2.1		76	2.8	.22	.29	.07	15.4	322
	R-1	3.8	4.0	1.6							15.4	322
	R-3	3.9	4.6	0.9							20.6	345
	R-B	3.7	3.1	1.1							18.0	337
ODU-1	R-m1	4.2	3.2	1.5	6-12							
	-ss	-	3.7	0.2								
Osprey	R ₃		1.5	4.0								
	R ₂		5.8	2.3								
	R ₁		4.1	1.3								

Nine Foot Shoal South		10-07-80		MLW 1410		TIME	SALINITY ‰	TEMP (°C)	TSM (mg/L)	TSI (mg/L)	TSO (mg/L)	PERCENT ORGANICS	PRIMARY	SECONDARY	TOTAL
		LATITUDE	LONGITUDE	SIZE MODE	SIZE MODE								COUNT X 10 ⁻⁴		
Holton	L-S	37° 03.68'	76° 00.27'	1310	31.3	19.5	13.8	12.2	1.6	11.6	-	-	-	-	37.2
	L-1				31.3	19.5	20.2	18.0	1.9	9.4	8-10	25-32			26.3
	L-3				31.7	19.4	29.2	25.8	3.3	11.4	8-10	25-32			43.3
	L-B				31.7	19.3	58.6	53.4	5.8	9.0	8-10				45.7
ODU-1	L	-	-	1250	-	-	11.2	8.7	2.4	21.6	8-10				36.4
Osprey	L ₃	37° 03.70'	76° 00.86'	1249	-	-	17.5	16.1	1.4	8.0	8-10				23.0
	L ₂	37° 03.74'	76° 00.91'		-	-	10.6	9.0	1.6	15.1	16-20	8-10			34.6
	L ₁	37° 03.75'	76° 00.96'		-	-	4.6	3.8	0.8	17.4	20-25	8-10			30.3
Holton	R-S	37° 03.60'	76° 00.53'	1254	27.7	19.7	4.1	3.1	1.0	24.6	20-25	8-10 ^b			20.5
	R-1				27.7	19.7	4.6	3.1	1.5	33.3	20-25	8-10 ^b			27.1
	R-3				30.2	19.5	32.1	29.2	2.9	9.0	8-10	20-25			34.0
	R-B				30.7	19.4	48.4	44.3	4.1	8.5	-	-			-
ODU-1	R	-	-	1300	-	-	3.1	2.1	1.0	32.0	20-25	8-10 ^b			11.6
Osprey	R ₃	37° 03.52'	76° 00.60'	1256	-	-	4.7	3.7	1.0	21.3	20-25	8-10			27.7
	R ₂	37° 03.48'	76° 00.36'		-	-	3.5	2.6	0.9	25.7	20-25	8-10			24.4
	R ₁	37° 03.57'	76° 00.66'		-	-	7.1	6.1	1.0	14.1	-	-			-

Inner Middle Ground Shoal		10-07-80	MLW 1410										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/l)	TSI (mg/l)	TSO (mg/l)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT X 10 ⁻⁴
Holton	L-S	37° 04.23'	75° 59.07'	1420	30.2	19.2	21.4	19.2	2.2	10.3	-	-	-
	L-1				30.2	19.2	26.4	23.8	2.6	9.8	8-10	20-25	24.8
	L-3				30.6	19.3	33.4	30.6	2.8	8.4	40-50	80-100	32.1
	L-B				30.6	19.3	41.2	38.0	3.2	7.7	8-10		32.8
ODU-1	L	-	-	1427	-	-	16.1	14.4	1.7	10.6	20-25	8-10	39.4
Osprey	L ₃	37° 04.09'	76° 00.36'	1429	-	-	5.7	4.6	1.1	19.3	20-25	8-10	34.1
	L ₂	37° 04.09'	76° 00.40'		-	-	14.2	12.6	1.6	11.6	-	-	-
	L ₁	37° 04.18'	76° 00.42'		-	-	14.3	12.7	1.6	11.1	20-25	8-10	32.0
Holton	R-S	37° 04.13'	75° 59.83'	1434	29.1	19.6	8.1	6.9	1.2	14.7	20-25	8-10	38.0
	R-1				29.1	19.6	6.5	5.2	1.3	20.6	20-25	8-10	38.3
	R-3				30.2	19.7	14.1	12.4	1.6	11.5	-	-	-
	R-B				31.3	19.3	25.5	23.0	2.5	9.9	-	-	-
ODU-1	R	-	-	1435	-	-	4.5	3.6	0.9	20.0	20-25	8-10	27.6
Osprey	R ₃	37° 03.78'	76° 00.17'	1436	-	-	4.5	3.6	0.9	20.0	20-25	8-10	30.0
	R ₂	37° 03.88'	76° 00.18'		-	-	9.8	7.6	2.0	20.6	20-25	8-10	23.8
	R ₁	37° 03.93'	76° 00.24'	-	-	-	4.5	3.7	0.8	17.8	20-25	8-10	35.5

MLW 1410

Inner Middle Ground Shoal		TOC (mg/L)	Chl ₃ (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	4.9	7.4	1.0		49	7.0	.40	.42	.02	69.4	245
	L-1	4.8	5.5	2.8								
	L-3	1.2	7.4	3.8								
	L-B	4.2	7.4	3.3								
ODU-1	L-m1	5.0	4.2	1.6	6-12						41.2	180
	-ss	3.9	5.5	1.0								
Osprey	L ₃		6.8	1.9								
	L ₂		6.1	2.6								
	L ₁		3.7	1.5								
ODU-1	ON-m1	12.4	5.8	4.9	12-16							
	-ss	15.1	0.6	4.9								
Holton	R-S	9.9	4.4	1.9		72	3.2	.24	.49	.25	69.4	220
	R-1	-	6.1	1.8								
	R-3	8.8	4.6	5.8								
	R-B	11.1	9.3	2.6								
ODU-1	R-m1	13.0	3.8	1.9	1-3						20.6	150
	-ss	-	3.5	1.6								
Osprey	R ₃		5.0	2.2								
	R ₂		6.2	2.2								
	R ₁		3.7	1.5								

Chesapeake Channel North		10-07-80	MLW 1410										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSN (mg/l)	TSI (mg/l)	TSO (mg/l)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT $\times 10^{-4}$
Holton	L-S	37° 02.02'	76° 03.00'	1600	25.2	20.0	4.2	3.0	1.2	28.6	25-32	8-10	28.6
	L-1				25.2	20.0	30.3	25.2	5.1	17.0	20-25	8-10	31.7
	L-3				28.4	19.5	8.8	7.3	1.5	17.5	-	-	-
	L-B				28.8	19.5	9.0	7.5	1.5	16.9	20-25	8-10	41.4
ODU-1	L	-	-	1555	-	-	3.0	2.2	0.8	27.6	20-25	8-10 ^b	28.1
Osprey	L3	37° 01.65'	76° 03.36'	1556	-	-	3.4	2.4	1.0	29.0	20-25	8-10	29.9
	L2	37° 01.73'	76° 03.45'		-	-	3.1	2.1	1.1	35.5	20-25	8-10 ^b	29.4
	L1	37° 01.75'	76° 03.49'		-	-	3.1	2.0	1.1	35.5	20-25	8-10 ^b	28.3
Holton	R-S	37° 01.97'	76° 03.20'	1537	25.2	20.0	2.4	1.3	1.1	45.8	20-25	8-10 ^b	26.2
	R-1				25.2	20.0	4.0	2.6	1.4	35.0	20-25	8-10	29.3
	R-3				26.2	20.0	4.7	3.2	1.5	31.0	20-25	8-10	31.0
	R-B				29.8	19.7	10.1	8.9	1.2	11.8	-	-	-
ODU-1	R	-	-	1537	-	-	3.0	1.9	1.1	35.7	20-25	8-10 ^b	25.4
Osprey	R3	37° 01.83'	76° 03.56'	1549	-	-	2.2	0.9	1.3	60.0	-	-	-
	R2	37° 01.79'	76° 03.61'		-	-	2.7	1.6	1.1	40.0	20-25	8-10 ^b	26.4
	R1	37° 01.85'	76° 03.61'		-	-	3.6	1.6	2.0	55.6	20-25	8-10 ^b	27.1

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MLW 1410

Chesapeake		TOC	Chl a	Phaeo-pig	Surface Tension	Percent	Albedo	K _d	K _u	K _u -K _d	Current	Current
Channel	North	(mg/l)	(mg/m ³)	(mg/m ³)	Lowering (dynes/cm)	Transmittance	(m ⁻¹)	(m ⁻¹)	(m ⁻¹)	(m ⁻¹)	Speed (cm/sec)	Direction
Holton	L-S	6.3	7.1	2.5		74	3.0	.17	.43	.26	64.3	255
	L-1	3.8	6.1	1.7							64.3	255
	L-3	0.7	6.1	1.8							38.6	170
	L-B	0.6	3.4	11.4							23.1	165
ODU-1	L-m1	13.1	7.7	3.2	3-6							
	-ss	-	7.7	1.5								
Osprey	L ₃		6.5	1.1								
	L ₂		5.6	1.7								
	L ₁		6.8	1.0								
ODU-1	ON-m1	-	-	-	12-16							
	-ss	-	-	-								
Holton	R-S	10.4	5.5	1.8		73	3.2	.20	.58	.38	74.5	230
	R-1	-	8.9	2.1							74.5	230
	R-3	2.2	8.5	1.9							59.1	185
	R-B	1.7	6.2	1.5							12.9	110
ODU-1	R-m1	5.9	6.3	2.4	3-6							
	-ss	3.3	5.2	1.6								
Osprey	R ₃		5.2	1.3								
	R ₂		7.0	0.8								
	R ₁		5.2	1.3								

Middle Ground Shoal South		10-08-80	MLW 1449										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/L)	TSI (mg/L)	TSO (mg/L)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT x 10 ⁻⁴
Holton	L-S	37° 02.07'	76° 02.18'	1217	30.2	19.3	7.6	6.5	1.1	14.5	20-25	8-10	19.6
	L-1				30.2	19.3	8.9	7.7	1.1	12.9	20-25	8-10	22.6
	L-3				30.6	19.2	9.3	8.1	1.1	12.2	20-25	8-10 ^b	24.1
	L-B				30.6	19.2	12.1	10.7	1.4	11.8	20-25	8-10	27.8
ODU-1	L	-	-	1224	-	-	6.0	5.2	0.8	13.0	20-25	8-10 ^c	18.1
Osprey	L	37° 02.12'	76° 02.86'	1213	-	-	8.8	7.7	1.1	13.0	20-25		20.4
ODU-1	ON	-	-	1217	-	-	5.9	5.3	0.6	10.0	20-25	8-10 ^b	24.5
Holton	R-S	37° 01.83'	76° 02.53'	1154	29.1	19.7	3.9	2.7	1.2	30.8	20-25	64-60 ^a	26.5
	R-1				29.1	19.7	4.2	3.5	0.7	16.8	20-25	8-10	27.4
	R-3				29.9	19.4	7.7	6.6	1.1	14.1	20-25	8-10	21.4
	R-B				29.9	19.4	7.1	6.4	0.7	9.6	20-25	8-10	20.3
ODU-1	R	-	-	1210	-	-	3.8	2.7	1.1	28.0	20-25	8-10 ^b	16.1
Osprey	R	37° 02.13'	76° 02.96'	1210	-	-	11.2	9.7	1.5	15.0	20-25	80-100	26.0

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MLW 1449

Middle Ground Shoal South		Surface Tension				Percent Transmittance	Albedo (m^{-1})	K_d (m^{-1})	K_u (m^{-1})	$K_u - K_d$ (m^{-1})	Current Speed (cm/sec)	Current Direction
		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Lowering (dynes/cm)							
Holton	L-S	1.3	4.6	1.7		76	2.8	.26	.39	.13		
	L-1	2.6	6.8	0.8							30.8	030
	L-3	5.6	7.7	2.0							30.8	030
	L-B	0.5	6.8	1.5							25.7	085
											28.3	095
ODU-1	L-m1	3.9	4.3	4.8	3-6							
	-ss	5.2	6.1	0.9								
Osprey	L		7.9	2.5								
ODU-1	ON-m1	2.3	6.5	3.7	1-3							
	-ss	2.2	3.4	6.5								
Holton	R-S	0.6	4.3	3.0		83	1.9	.20	.34	.14		
	R-1	1.8	4.0	1.8							30.8	350
	R-3	3.5	6.5	2.1							30.8	355
	R-B	0.2	-	-							30.8	355
ODU-1	R-m1	3.3	6.5	1.9	3-6							
	-ss	2.0	4.9	1.1								
Osprey	R		5.8	2.3								

Nine Foot Shoal South		10-08-80		KLW 1449		SALINITY ‰	TEMP (°C)	TSM (mg/L)	TSI (mg/L)	TSC (mg/L)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT x 10 ⁻⁴
		LATITUDE	LONGITUDE	TIME										
Holton	L-S	37° 03.92'	76° 00.28'	1258	30.9	19.3	16.0	14.3	1.7	10.3		10-12		37.3
	L-1				30.9	19.3	19.6	18.3	1.3	6.6		8-10		42.8
	L-3				30.9	19.2	32.9	30.5	2.4	7.2		8-10		39.5
	L-B				31.3	19.2	39.6	35.8	3.8	9.5		8-10		44.8
ODU-1	L	-	-	1305	-	-	18.1	16.4	1.7	9.4		8-10		22.6
Osprey	L	37° 03.83'	76° 00.56'	1320	-	-	28.1	25.1	3.0	11.0		8-10		36.1
CDU-1	ON	-	-	1310	-	-	24.2	22.5	1.7	7.1		8-10		34.7
Osprey	ON	37° 03.85'	76° 00.13'	1317	-	-	25.9	23.0	2.9	11.0		10-12		39.8
Holton	R-S	37° 03.67'	76° 00.13'	1313	29.5	19.4	7.9	6.7	1.2	15.8		20-25	8-10	24.7
	R-1				29.5	19.4	8.8	7.5	1.3	15.1		20-25	8-10	28.9
	R-3				30.6	19.2	22.7	20.2	2.5	11.2		8-10		33.2
	R-B				30.9	19.2	34.3	31.4	2.9	8.4		8-10		40.0
ODU-1	R	-	-	1319	-	-	6.2	5.2	1.0	16.0		20-25	8-10	22.9
Osprey	R ₂	37° 03.77'	76° 00.46'	1322	-	-	14.4	12.6	1.8	12.4		10-12		22.3

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MLW 1449

Nine Foot Shoal South		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	6.8	9.1	1.9		51	6.6	.38	.74	.36		
	L-1	2.9	8.3	2.7							43.7	060
	L-3	3.2	6.5	2.7							43.7	060
	L-B	1.2	12.0	3.0							38.6	045
ODU-1	L-m1	8.7	10.9	1.3	1-3						30.8	055
	-ss	2.0	2.0	13.7								
Osprey	L ₁		9.8	1.8								
ODU-1	ON-m1	-	6.5	1.9	3-6							
	-ss	-	9.0	3.1								
Osprey	ON		8.9	2.1								
Holton	R-S	6.0	5.8	2.1		71	3.4	.23	.45	.22		
	R-1	-	4.6	3.5							51.4	035
	R-3	0.5	8.6	0.8							51.4	035
	R-B	1.6	9.5	3.5							48.8	095
ODU-1	R-m1	2.7	7.1	1.0	1-3						38.6	155
	-ss	3.3	10.0	0.1								
Osprey	R ₂		7.1	2.3								

Nine Foot shoal South		10-08-80	MLW 1449										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/L)	TSI (mg/L)	TSO (mg/L)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT x 10 ⁻⁴
Holton	L-S	37° 03.57'	75° 59.83'	1402	30.2	19.3	8.6	7.4	1.2	13.6	20-25		13.9
	L-1				30.2	19.3	9.7	8.3	1.4	14.1	20-25	8-10	14.5
	L-3				30.6	19.2	19.3	17.4	1.9	9.6		16-20	22.3
	L-B				30.6	19.2	66.5	60.8	5.7	8.6	8-10		28.7
ODU-1	L	-	-	1412	-	-	14.9	12.0	2.9	19.5	8-10		20.0
Osprey	L ₂	37° 03.55'	76° 00.04'	1343	-	-	18.0	16.8	1.2	6.7	10-12		27.6
Osprey	OR	37° 03.61'	76° 00.12'	1341	-	-	18.4	16.6	1.8	10.0	8-10		29.2
ODU-1	OR	-	-	1400	-	-	12.8	11.5	1.3	10.2	8-10	16-20	19.0
Holton	R-S	37° 03.58'	75° 59.85'	1343	29.5	19.4	5.8	4.5	1.3	22.8	20-25	8-10	20.2
	R-1				29.5	19.4	9.4	7.7	1.7	18.2	20-25	8-10	14.2
	R-3				30.2	19.3	20.3	18.2	2.1	10.1	8-10		42.5
	R-B				30.6	19.2	32.6	29.8	2.8	8.4	20-25	8-10 ^C	
ODU-1	R	-	-	1353	-	-	5.1	4.0	1.1	21.6	20-25	8-10	11.9
Osprey	R ₁	37° 03.63'	76° 00.08'	1339	-	-	13.8	12.1	1.7	12.6	8-10		29.8
Osprey	L ₃	37° 03.47'	75° 59.96'	1403	-	-	15.4	13.4	2.0	12.8	10-12		20.9
	L ₂	37° 03.41'	76° 00.06'	1405	-	-	15.7	13.8	1.9	12.0	10-12		25.6
	L ₁	37° 03.53'	76° 00.11'	1401	-	-	12.5	11.1	1.4	11.0	10-12		23.6
	R ₁	37° 03.43'	75° 59.94'	1407	-	-	8.0	6.7	1.3	15.7	10-12		32.2
	R ₂	37° 03.39'	75° 59.76'	1409	-	-	7.8	6.8	1.0	13.2	20-25	8-10	21.0
	R ₃	37° 03.34'	75° 59.61'	1411	-	-	7.6	6.2	1.4	18.8	10-12		33.9

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MLW 1449

Nine Foot Shoal South		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	-	8.0	2.2		69	3.7	.24	.54	.30	64.3	100
	L-1	-	7.8	2.0							64.3	100
	L-3	-	7.3	2.1							51.4	120
	L-B	8.8	8.9	3.6							36.0	125
ODU-1	L-m1	-	8.0	1.4	1-3							
	-ss	-	9.0	2.1								
Osprey	L ₂		6.8	2.4								
	ON		7.1	2.6								
ODU-1	ON-m1	-	8.6	0.9	3-6							
	-ss	1.9	8.1	2.8								
Holton	R-S	2.4	5.5	2.6		70	3.6	.31	.64	.33	59.1	075
	R-1	-	5.8	3.0							59.1	075
	R-3	5.0	7.6	0.1							56.5	090
	R-B	-	8.8	1.7							46.3	120
ODU-1	R-m1	3.2	5.2	3.1	1-3							
	-ss	2.0	6.1	1.2								
Osprey	R ₁		8.0	1.7								
Osprey	L ₃		7.1	2.6								
	L ₂		5.6	2.2								
	L ₁		8.5	2.0								
	R ₃		4.6	6.4								
	R ₂		-	-								
	R ₁		7.6	0.5								

Inner Middle Ground Shoal		10-08-80	MLW 1449										
		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/l)	TSI (mg/l)	TSO (mg/l)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT X 10 ⁻⁴
Holton	L-S	37° 04.18'	75° 59.68'	1520	29.5	19.3	18.0	15.9	2.1	11.5	8-10		
	L-1				29.5	19.3	20.0	17.7	2.3	11.3	8-10		36.5
	L-3				29.5	19.2	29.4	26.9	2.5	8.5	8-10		39.3
	L-B				29.9	19.2	25.9	23.8	2.1	8.0	8-10		37.7
ODU-1	L	-	-	1523	-	-	21.0	18.5	2.5	11.9	8-10		41.0
Osprey	L	37° 03.83'	75° 59.86'	1519	-	-	11.7	10.1	1.7	14.8	20-25	20-25	30.7
Osprey	ON ₁	37° 03.93'	76° 00.06'	1516	-	-	8.8	6.6	2.2	25.0	20-25		32.8
	ON ₂	37° 03.88'	76° 00.10'	1517	-	-	9.3	8.1	1.2	13.0	20-25		29.9
ODU-1	ON	-	-	1510	-	-	24.5	22.8	1.7	6.9	10-12	8-10	25.2
Holton	R-S	37° 04.07'	75° 59.67'	1502	28.8	19.4	5.4	3.7	1.7	32.4	20-25		27.5
	R-1				28.8	19.4	11.8	10.6	1.7	10.4	20-25	8-10	26.4
	R-3				29.5	19.3	17.4	15.4	2.0	11.7	8-10	8-10	28.3
	R-B				29.9	19.3	35.4	32.4	3.0	8.6	8-10	20-25	37.2
ODU-1	R	-	-	1502	-	-	10.1	8.8	1.3	12.9	20-25	8-10	33.9
													16.2

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MLW 1449

Inner Middle Ground Shoal												
		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	7.0	9.2	3.1		51	6.6	.37	.51	.14		
	L-1	4.6	9.5	3.2							46.3	220
	L-3	10.0	6.3	5.8							46.3	220
	L-B	5.5	9.3	2.7							41.1	165
											25.7	150
ODU-1	L-m1	4.6	1.5	3.0	1-3							
	-ss	-	8.2	2.3								
Osprey	L		7.1	2.1								
Osprey	OH ₁		4.6	6.4								
	OH ₂		-	-								
ODU-1	ON-m1	11.8	7.4	2.8	1-3							
	-ss	-	10.1	4.0								
Holton	R-S	5.1	6.2	1.6		68	3.9	.24	.64	.40		
	R-1	-	7.4	3.1							36.0	205
	R-3	2.5	4.9	1.9							36.0	205
	R-B	14.7	7.1	3.4							33.4	175
											12.9	230
ODU-1	R-m1	7.2	6.5	2.4	1-3							
	-ss	2.1	5.0	1.8								

Inner Middle Ground Shoal		10-08-80	MLW 1449										
		LATITUDE	LONGITUDE	TIME	SALINITY c/oo	TEMP (°C)	TSM (mg/l)	TSI (mg/l)	TSO (mg/l)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT x 10 ⁴
Holton	L-S	37° 04.20'	75° 59.70'	1547	28.4	19.2	33.9	22.6	11.3	33.3	12-16		27.8
	L-1				28.4	19.2	23.7	22.2	1.5	6.1	8-10	20-25	26.0
	L-3				28.4	19.2	16.1	12.5	3.6	22.2	8-10	20-25	31.0
	L-B				28.4	19.2	20.3	18.5	1.8	8.9	6-8	20-25	20.4
ODU-1	L	-	-	1540	-	-	16.1	14.6	1.5	9.0	8-10	20-25	40.1
Osprey	L	37° 03.98'	76° 00.00'	1539	-	-	8.7	6.5	2.2	25.3	20-25	8-10 ^b	27.4
Osprey	ON	37° 04.02'	76° 00.11'	1537	-	-	7.6	6.6	1.0	12.7	20-25	8-10	28.6
ODU-1	ON	-	-	1547	-	-	14.0	12.8	1.2	9.0	20-25	8-10 ^b	23.9
Holton	R-S	37° 04.13'	75° 59.72'	1602	27.7	19.5	8.7	7.7	1.0	11.6	20-25	6-8	17.2
	R-1				27.7	19.5	13.6	12.7	0.9	6.6	20-25	8-10	16.5
	R-3				28.1	19.4	10.2	9.2	1.0	9.8	20-25	8-10 ^c	20.4
	R-B				28.8	19.3	19.9	18.1	1.8	9.2	6-8	16-20	21.5
ODU-1	R	-	-	1556	-	-	5.3	3.9	1.4	27.1	20-25	8-10 ^b	20.4
Osprey	R ₄	37° 03.83'	75° 59.95'	1541	-	-	6.8	5.8	1.0	15.4	20-25	8-10 ^b	20.6

10-08-80

MLW 1449

Inner Middle Ground Shoal		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
Holton	L-S	6.7	7.4	1.5		60	5.1	-	-	-	46.3	240
	L-1	1.9	8.2	2.3							46.3	240
	L-3	3.0	9.5	3.0							38.6	185
	L-B	9.1	9.1	4.0							25.7	290
ODU-1	L-m1	3.6	9.2	4.4	1-3							
	-ss	2.7	9.5	0.9								
Osprey	L (L ₄)		6.1	3.0								
Osprey	ON(L ₁)		6.8	2.4								
ODU-1	ON-m1	-	9.5	5.6	1-3							
	-ss	2.9	6.1	3.0								
Holton	R-S	5.7	6.1	2.0		71	3.4	-	-	-	59.1	200
	R-1	15.0	7.1	1.8							59.1	200
	R-3	0.3	7.4	4.5							46.3	160
	R-B	4.5	8.1	2.9							28.3	150
ODU-1	R-m1	4.4	3.8	6.8	3-6							
	-ss	-	8.6	3.2								
Osprey	R ₄		6.8	2.9								

10-09-80 MLW 1525

North Channel		LATITUDE	LONGITUDE	TIME	SALINITY ‰	TEMP (°C)	TSM (mg/L)	TSI (mg/L)	TSO (mg/L)	PERCENT ORGANICS	PRIMARY SIZE MODE (μ)	SECONDARY SIZE MODE (μ)	TOTAL COUNT X 10 ⁻⁴
Holton Water Column	L-S	37° 03.84'	75° 59.87'	1506	29.4	19.9	8.9	-	-	-	20-25	8-10	33.1
	L-S	37° 03.11'	75° 58.74'	1545	29.3	19.9	9.9	8.1	1.8	18.3	20-25	8-10	24.1
	L-S	37° 03.38'	75° 58.78'	1636	28.1	20.4	7.4	5.3	2.1	28.4	20-25	-	28.1
	L-S	37° 03.83'	75° 59.37'	1652	26.2	19.4	6.1	5.0	1.1	18.2	20-25	8-10	25.2
	L-1	-	-	1700	26.2	19.4	9.8	7.9	1.9	19.5	20-25	8-10 ^b	24.7
	L-3	-	-	1659	26.2	19.4	10.4	8.7	1.7	16.3	10-14	8-10 ^d	23.7
	L-B	-	-	1655	26.6	19.4	11.6	10.1	1.5	12.4	20-25	8-10 ^b	26.8
ODU-1	L	-	-	1510	-	-	10.6	8.3	2.3	21.7	20-25	8-10 ^b	30.3
	L	-	-	1645	-	-	6.6	5.0	1.6	24.1	20-25	8-10 ^b	20.9
	L	-	-	1703	-	-	9.0	6.9	2.1	23.5	20-25	8-10 ^b	21.2
Osprey	L	37° 03.65'	76° 00.57'	1700	27.0	20.2	3.8	2.5	1.3	35.1	20-25	8-10 ^b	16.4
Holton	ON	37° 03.48'	75° 59.66'	1631	28.3	20.1	15.0	8.2	6.8	45.4	16-20	64-80	28.3
ODU-1	ON	-	-	1642	-	-	5.0	3.4	1.6	31.1	20-25	8-10 ^b	21.0
	ON	-	-	1710	-	-	7.8	5.3	2.5	31.4	20-25	8-10 ^b	20.0
	ON-m1	-	-	1600	-	-	15.3	10.3	5.0	32.8	16-20	-	28.8
	-ss	-	-	-	-	-	7.7	6.1	1.6	21.5	20-25	8-10	25.3
Osprey	ON	37° 03.55'	76° 00.56'	1700	-	-	3.6	1.7	1.9	52.9	20-25	8-10 ^b	14.9
	ON	37° 04.03'	76° 00.36'	1612	-	-	6.9	5.2	1.7	39.6	20-25	8-10 ^b	20.0
Holton Water Column	R-S	37° 04.03'	76° 00.12'	1500	29.4	20.5	6.8	4.6	2.2	35.5	20-25	8-10	25.9
	R-S	37° 03.09'	75° 58.81'	1536	29.4	20.5	8.9	6.5	2.4	27.4	20-25	8-10	27.2
	R-S	37° 03.50'	75° 59.85'	1624	28.5	20.1	4.4	2.9	1.5	33.3	20-25	8-10 ^b	17.8
	R-S	37° 03.85'	75° 59.52'	1712	26.2	19.7	5.0	3.8	1.2	23.9	20-25	8-10 ^d	27.2
	R-1	-	-	1719	26.2	19.7	5.3	3.2	2.1	39.6	-	-	-
	R-3	-	-	1718	26.2	19.5	6.2	4.9	1.3	21.4	20-25	8-10 ^d	22.3
	R-B	-	-	1713	26.6	19.4	10.9	8.4	2.5	22.8	20-25	8-10 ^c	27.4
ODU-1	R	-	-	1502	-	-	5.9	4.0	1.9	32.1	20-25	8-10 ^c	18.0
	R	-	-	1631	-	-	4.0	2.3	1.7	42.9	20-25	8-10 ^b	17.5
	R	-	-	1719	-	-	4.9	2.8	2.1	42.5	20-25	6-8 ^b	19.5
Osprey	R	37° 03.51'	76° 00.65'	1700	27.3	20.2	3.6	1.4	2.2	60.6	20-25	8-10 ^b	16.0
	R	37° 03.93'	76° 00.26'	1620	27.3	20.3	4.6	2.4	2.2	47.6	20-25	8-10	22.5

MLW 1525

North Channel

[illegible]

		TOC (mg/L)	Chl a (mg/m ³)	Phaeo-pig (mg/m ³)	Surface Tension Lowering (dynes/cm)	Percent Transmittance	Albedo (m ⁻¹)	K _d (m ⁻¹)	K _u (m ⁻¹)	K _u -K _d (m ⁻¹)	Current Speed (cm/sec)	Current Direction
ODU-1	R-m1	9.2	6.7	5.5	3-6							
	-ss	3.9	7.6	4.4								
	R-m1	2.8	7.3	4.4	16-19							
	-ss	3.6	-	-								
	R-m1	4.8	5.6	3.3	3-6							
	-ss	7.8	7.4	2.8								
Osprey	R		5.5	3.5								
	R		7.3	3.3								

Chesapeake Channel North

(10/07/80)	Holton				ODU-1	Oasprey			Holton				ODU-1	Oasprey		
Samples Collected	L-S	L-1	L-3	L-B	L	L ₁	L ₂	L ₃	R-S	R-1	R-3	R-B	R	R ₁	R ₂	R ₃
<u>Skeletonema costatum</u>	A		A	X	A	A	A	A	A	A	A	A	A	A	X	A
<u>Coscinodiscus</u> sp.	A	X	A	X	X	X	A	A	X	X	X	X	X	A	A	X
<u>Chaetoceros</u> sp.	X	X	P	X			P		P	P	X	P	P	P	P	
<u>Biddulphia</u> sp.	X	X	P	X	P				P	X	X	P	P	P	P	P
<u>Rhizosolenia</u> sp.									P				P			
<u>Thalassiosira</u> sp.			X	X	P	P			P	X	X	P	X	X	X	
Unidentified Chain Diatom	X		P	P	P				P	X	P	P	P	P	P	P
<u>Thalassionema</u> sp.	P															
<u>Thalassiothrix</u> sp.		P	P				X	P						P	P	
<u>Pleurosigma</u> sp.			P		P	P			P	P	P	P				
<u>Ceratium</u> sp.					P				P	P						
<u>Peridinium</u> sp.	P	P	X	X	P	A	X	A	X	X	P	X		X	P	X
<u>Dinophysis</u> sp.						P								P		
<u>Tintinnids</u>	P	X	X	P	X	X	X	A	P	P	P	P	P	X	X	X
Lamellibranch Larvae			P	P		P	P	P	P	P	P					P
Copepod	P			P		P	P	P	P	P	P	X	P	P	P	P
Resting Spores	P	P	X	P	P	P	X	P	X	X	X	P	X	X	P	
Fecal Pellets	P	P	P	P					P	P		P			P	
Quartz Grains	P	X	X	A	P				P	X	X	A	P	X	X	P
Opaque Mineral Grains		P	P	X	P					P	P	P	P		P	
Aggregates	X	X	A	X	X	A	X	P	A	X	X	A	X	A	A	X
Fly Ash								P								
Inorganic/Organic Fibers	P	P	P	P	A	P	X	P	P	P	P	P	P	P	P	P

Key: On this and the tables which follow, A = abundant, P = present, and X = absent.

Nine-Foot Shoal South

(10/07/80)	Holton				ODU-1	Osprey			Holton				ODU-1	Osprey		
<u>Samples Collected</u>	<u>L-S</u>	<u>L-1</u>	<u>L-3</u>	<u>L-E</u>	<u>L</u>	<u>L₂</u>	<u>L₃</u>	<u>L₄</u>	<u>R-S</u>	<u>R-1</u>	<u>R-3</u>	<u>R-E</u>	<u>R</u>	<u>R₂</u>	<u>R₃</u>	<u>R₄</u>
<u>Skeletonema costatum</u>	P	P	P	P	X	P	A	A	A	X	P	P	X	A	A	X
<u>Coscinodiscus sp.</u>	A	A	A	A	A	P	X	P	A	A	A	A	P	A	A	P
<u>Chaetoceros sp.</u>						P										P
<u>Biddolphia sp.</u>	P	A	P	X	P	X	P	A	P	P	X	P	P	X	X	X
<u>Rhizosolenia sp.</u>									X						P	P
<u>Thalassiosira sp.</u>	P	P	P	P		X	X	P		P	P	P		P	X	X
Unidentified Chain Diatom	P	P	P	P	P	P	P		P	P	P	P	P	P		
<u>Thalassionema sp.</u>					P				P		P					
<u>Thalassiothris sp.</u>							P		P		P			X	A	P
<u>Pleurosigma sp.</u>		P		X	P		P	P	P			P	P		P	P
<u>Ceratium sp.</u>	P															
<u>Peridinium sp.</u>		P	P		X	P	X	X	X	P	P	P	A	X	A	X
<u>Dinophysis sp.</u>	P							P								
<u>Tintinnids</u>	P	X	X	P	P	P	P	P	A	A	P	P	X	A	A	P
Lamellibranch Larvae	P		P		P	P	X	P	P	P			P	P	P	P
Copepod	P		P	P		P	P	P		P	P	P	P	P	P	P
Resting Spores	P	X	P	P	P	P	P	P	P	P	P	P		P	P	P
Fecal Pellets	P	P	P	P	P	P	P	P		P	X	P		P	P	P
Quartz Grains	A	A	A	A	X	P	X	P	P	P	A	A	P	X	P	X
Opaque Mineral Grains	P	P	P	X	P	X			P	P	X	X		P	P	P
Aggregates	A	A	A	A	X	A	A	A	P	P	A	A	P	X	X	A
Flv Ash							P	P								
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Inner Middle Ground Shoal

(10/07/80) Samples Collected	Holton				ODU-1	Osprey			Holton				ODU-1	Osprey		
	L-S	L-1	L-3	L-B	L	L ₂	L ₂	L ₁	R-S	R-1	R-3	R-B	R	R ₂	R ₂	R ₁
<u>Skeletonema costatum</u>	P	P	P	P	P	A	X	X	X	A	P	X	A	A	A	A
<u>Coscinodiscus</u> sp.	A	A	A	A	A	P	A	P	A	A	A	A	P	X	X	P
<u>Chaetoceros</u> sp.					P		P			P				P		
<u>Biddolphia</u> sp.	P		P	P	P	P	P	P	P	P	P	P		P		P
<u>Rhizosolenia</u> sp.						P			P	P	P		P	P		
<u>Thalassiosira</u> sp.	P	P	P	P	P	X	X		P	P	P	P	X	P		X
Unidentified Chain Diatom	P	P	P	P	X		P	P	P	P	P	P	P	P	P	P
<u>Thalassionema</u> sp.									P							
<u>Thalassiothris</u> sp.			P		P	P	P		X	X	P	P	P	P	P	P
<u>Pleurosigma</u> sp.	X	P	P	P	P		P		P			P	P	P		
<u>Ceratium</u> sp.								P								
<u>Peridinium</u> sp.	P	P	P	P	X	P	P	P	X	A	X	P	A	X	P	A
<u>Dinophysis</u> sp.					P			P					P	X		
<u>Tintinnids</u>	A	P	P	P	P	X	X	X	X	X	P	P	X	A	A	A
Lamellibranch Larvae	P	P	P		P	P	P	P					X	P	P	P
Copepod	P	P		P		P		P		P	P	P	P		P	
Resting Spores	P		P	P	P	P		P	P		P	P		P	P	P
Fecal Pellets	P		P	P	P	P	P	P	P	P	P	P		P	P	P
Quartz Grains	A	X	A	A	A	P	X	P	X	X	A	A	P	P	X	P
Opaque Mineral Grains	P	P	P	X	P	P	X	P	P		P	P		P	X	P
Aggregates	A	A	A	A	A	X	A	A	X	X	A	A	X	A	A	A
Fly Ash					P		P						P		P	
Inorganic/Organic Fibers	P	P	P	P	P	P	A	P	X	P	P	P	P	P	X	P

Chesapeake Channel North

(10/07/80) Samples Collected	Holton				ODU-1	Osprey			Holton				ODU-1	Osprey		
	L-S	I-1	L-3	L-B	L	L ₂	L ₂	L ₁	R-S	R-1	R-3	R-B	R	R ₂	R ₂	R ₁
<u>Skeletonema costatum</u>	A	A	X	A	A	A	A	A	A	A	A	A	A	A	A	A
<u>Coscinodiscus</u> sp.	A	A	A	A	P	P	X	X	A	A	A	A	P	X	X	X
<u>Chaetoceros</u> sp.					X	P					P		P			
<u>Biddolphia</u> sp.	P		P	P	P	P		P		P	P	X			P	P
<u>Rhizosolenia</u> sp.				P							P		P			P
<u>Thalassiosira</u> sp.			X	X	P	P	X				X	P			P	
Unidentified Chain Diatom	P	A	A	P			P		P	X	X	X	P			X
<u>Thalassionema</u> sp.																
<u>Thalassiothris</u> sp.	P	X	P		P	X	P	X	X	P	P	P	X	P	X	P
<u>Pleurosigma</u> sp.			P	P						P	P	P				
<u>Ceratium</u> sp.	P		P	P		P	P	P		P	X		P	P	P	P
<u>Peridinium</u> sp.	X	A	X	X	A	A	A	A	A	X	A	P	A	A	A	A
<u>Dinophysis</u> sp.	P		P	P	P	X	A	A	P	X	P	X	X	P	P	P
<u>Tintinnids</u>	X	P	P	A	P	X	A	A	P	A	X	X	P	A	A	A
Lamellibranch Larvae	P	P	P		P	P	X	X		P	P	P	P	A	P	P
Copepod	P	P	P	P	P	P	P	P		P	P	P	P	X	P	P
Resting Spores		P	P	X				X	P	P	P	P		P		
Fecal Pellets	P			P								P	P			P
Quartz Grains		P	P	P	P		P	P			P	X	P			
Opaque Mineral Grains		P	P	P	P		P				P	P				
Aggregates	P	P	X	A	P	X	X	X	P	P	A	A	X	P	X	X
Fly Ash							P	P								
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Inner Middle Ground Shoal

(10/08/80)														
Samples Collected	Holton				ODU-1	Osprey	Osprey		ODU-1	Holton				ODU-1
	L-S	L-1	L-3	L-B	L	L	ON ₁	ON ₂	ON	R-S	R-1	R-3	R-B	R
<u>Skeletonema costatum</u>	A	P	X	P	X	X	X	X	P	A	A	A	P	A
<u>Coscinodiscus</u> sp.	A	A	X	A	A	A	X	P	A	A	A	X	A	A
<u>Chaetoceros</u> sp.				P	P	P				P			X	P
<u>Biddolphia</u> sp.	X	P	P	P	P	P	P	P	P	P	P			X
<u>Rhizosolenia</u> sp.								P						X
<u>Thalassiosira</u> sp.	X	P	X	P		X	X	X		X	P	X	P	
Unidentified Chain Diatom	P	X		P	X	P		P	P	P	P	P	P	P
<u>Thalassionema</u> sp.									P	P	P	P	P	P
<u>Thalassiothrix</u> sp.		P	P				P	P		P	P	P	P	
<u>Pleurosigma</u> sp.	P	P		X		P		P	X	P	P			P
<u>Ceratium</u> sp.				P						P	P			
<u>Peridinium</u> sp.	P	P	P	P	P	P	P	P	X	P	P	P	P	X
<u>Dinophysis</u> sp.														
<u>Tintinnids</u>	P	X	A	P	P	P	P	P		X	X	X	P	
Lamellibranch Larvae	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Copepod	P	P	P	P	X	P	X	X	P	P	P	X	X	X
Resting Spores		P	P	P	P	X	P	P	P	P			P	X
Fecal Pellets	P	P	P	P	P				P	P	P	P	P	P
Quartz Grains	A	A	A	A	A	X	X	X	A	X	X	A	A	X
Opaque Mineral Grains	P	P	P	P	X	P		P	X		P	X	X	P
Aggregates	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Fly Ash														
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Nine Foot Shoal South

[illegible]

Nine-Foot Shoal South

(10/08/80) Samples Collected	Holton				ODU-1	Osprey	ODU-1	Osprey	Holton				ODU-1	Osprey
	L-S	L-1	L-3	L-B	L	L	ON	ON	R-S	R-1	R-3	R-B	R	R ₂
<u>Skeletonema costatum</u>	P	P	P	P	P	P	X	P	X	A	P	P	A	P
<u>Coscinodiscus</u> sp.	A	X	X	A	A	A	A	X	A	A	A	A	A	X
<u>Chaetoceros</u> sp.									P		P		X	P
<u>Biddolphia</u> sp.	X	X	P	P	A	P	X	P	X	P	P	X	P	X
<u>Rhizosolenia</u> sp.											P			
<u>Thalassiosira</u> sp.	P	P	P		X	P	P	X	P		P	P	P	X
Unidentified Chain Diatom	P	P	P	P	P	P	P		P		X	P	P	X
<u>Thalassionema</u> sp.											X		X	
<u>Thalassiothrix</u> sp.			P	P	P				X				X	
<u>Pleurosigma</u> sp.	P		P			P			P	P		P	X	
<u>Ceratium</u> sp.														
<u>Peridinium</u> sp.	P	P	P	P	P	P	X	P	X	X		P	X	P
<u>Dinophysis</u> sp.														
<u>Tintinnids</u>	P	P	P	P		P			P	P	P	P	X	P
Lamellibranch Larvae		P	P	P	P	P	P	P	P	P	P	P	P	P
Copepod	P	P	P	X	P	P	P	P	P	P	X	P	P	P
Resting Spores	P			P	P	P	X	P		P	X	P		P
Fecal Pellets	P	P	P	P	P	P			P	P	P	P		X
Quartz Grains	X	A	A	A	A	A	X	P	P	X	X	A	X	X
Opaque Mineral Grains	P		P	P	P	P	P		P	P	P	P		P
Aggregates	X	X	A	A	A	A	A	A	X	X	A	A	X	A
Fly Ash														
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Middle Ground Shoal South

[illegible]

North Channel

(10/09/80)	Holton			Water Column				ODU-1			Osprey	Holton	ODU-1				Osprey	
Samples Collected	L-S	L-S	L-S	L-S	L-1	L-3	L-B	L	L	L	L	ON	ON	ON	ON-m1	ON-ss	ON	ON
<u>Skeletonema costatum</u>	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
<u>Coscinodiscus</u> sp.	A	A	A	A	A	X	A	A	A	X	A	A	A	X	A	A	A	A
<u>Chaetoceros</u> sp.										P								
<u>Biddulphia</u> sp.	P	X	P	P	P	X	P	X	P	P	P		P	P	P	P	P	X
<u>Rhizosolenia</u> sp.			P															P
<u>Thalassiosira</u> sp.	P	P	P			P	P		X	P				P				
Unidentified Chain Diatom	P	X	X	P	A	P	P	P	P	P	P	X	P	P	P	P	P	P
<u>Thalassionema</u> sp.																		
<u>Thalassiothrix</u> sp.		P	X	P				P	P		P						P	
<u>Pleurosigma</u> sp.							P		P						P			
<u>Ceratium</u> sp.							P		P	P	P		P					
<u>Peridinium</u> sp.	P	X	X	P	A	X	X	X	A	X	A	P	A	X	P	X	A	X
<u>Dinophysis</u> sp.																		
<u>Tintinnids</u>		P	X					X	P	P	P		P		P			
Lamellibranch Larvae	P	X	X	P	P	P	P	P	P	P	P	P	P		P	P	X	P
Copepod		P	X	P	A	A	P	P	P		P	X	X	P	P	P	P	X
Resting Spores	P	P	P	P		P	P	P	P			P	P	P	P	P	P	
Fecal Pellets	P	P	P	P	P	P	P	P	P	P		P	P	P		P	P	X
Quartz Grains	A	X	P	P	X	X	A	X	P	X	P	P	P	P	P	P	P	X
Opaque Mineral Grains	P	X	P	P	P	X	P	P	P			P	P	P	P	P		P
Aggregates	A	X	A	A	A	A	A	A	X	P	P	P	X	P	P	A	P	X
Fly Ash				P					P			P		P	A		P	
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

(Continued)

North Channel (Concluded

(10/09/80)

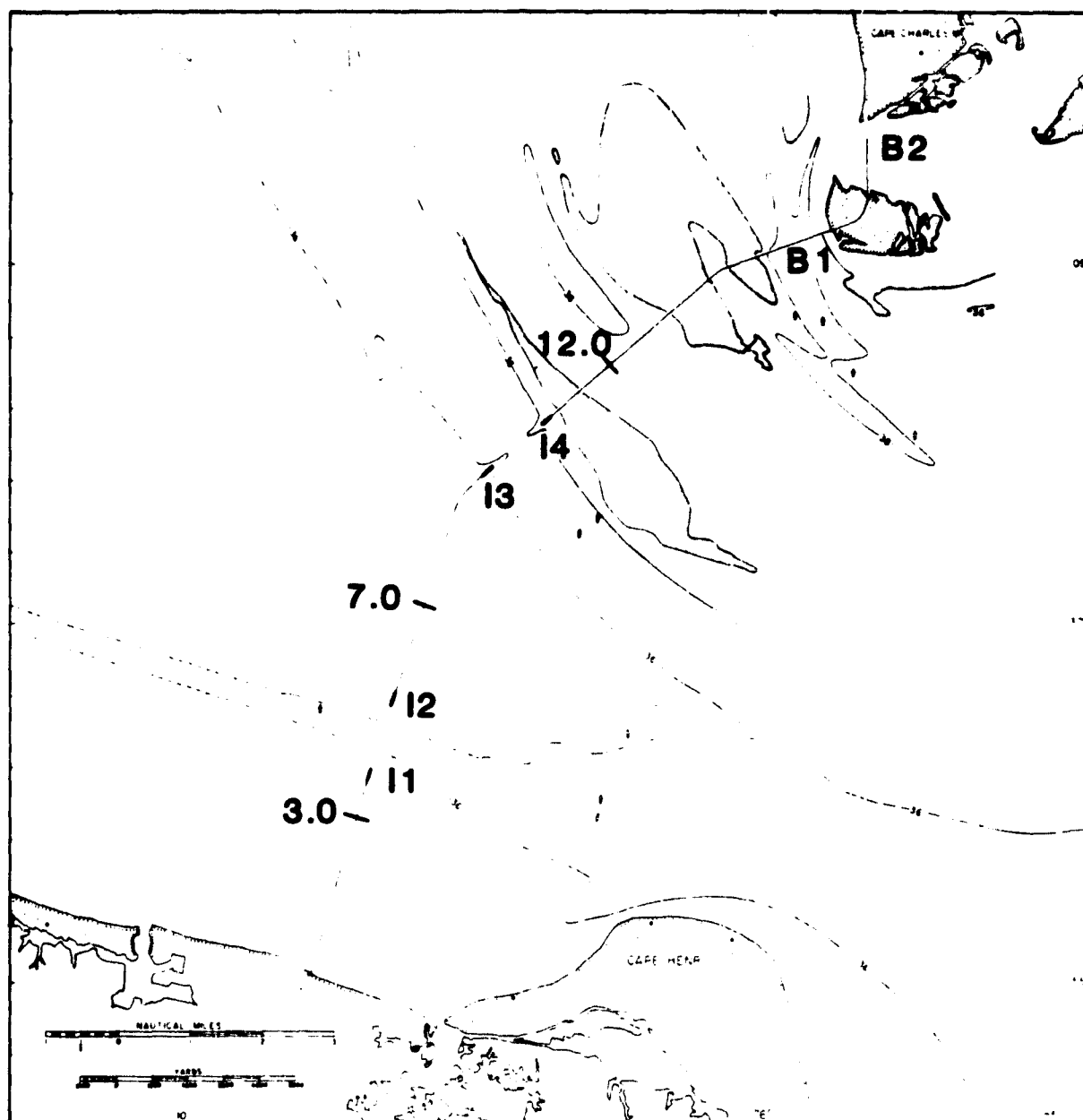
(10/09/80)	<u>Holton</u>			<u>Water Column</u>				<u>ODU-1</u>			<u>Osprey</u>	
<u>Samples Collected</u>	<u>R-S</u>	<u>R-S</u>	<u>R-S</u>	<u>R-S</u>	<u>R-1</u>	<u>R-3</u>	<u>R-B</u>	<u>R R</u>	<u>R R</u>	<u>R R</u>	<u>R R</u>	
<u>Skeletonema costatum</u>	A	A	A	A	A	P	A	A A A	A A			
<u>Coscinodiscus sp.</u>	A	A	X	A	A	X	X	A A X	X A			
<u>Chaetoceros sp.</u>												
<u>Biddolphia sp.</u>	P	P	X	P			P	X P		X	P	
<u>Rhizosolenia sp.</u>												
<u>Thalassiosira sp.</u>	P	P						P P		P		
Unidentified Chain Diatom	P	X	P	P	P	P	P	P P P	P P			
<u>Thalassionema sp.</u>												
<u>Thalassiothris sp.</u>	P	P						P P X	P P			
<u>Pleurosigma sp.</u>								P		P		
<u>Ceratium sp.</u>					P	P	P			X		
<u>Peridinium sp.</u>	X	X	A	A	A	X	X	X A X	A A			
<u>Dinophysis sp.</u>									X	X		
<u>Tintinnids</u>	P	P	P	P	P			P X A	X X			
Lamellibranch Larvae	P	P	P	P	P	P	P	P P P	P P			
Copepod	P	P	X	X	X	X	X	P P X	X P			
Resting Spores	X	P	P	P	P		P	P P	P P			
Fecal Pellets	P	P	P	P	P	P	P	P P P	P P			
Quartz Grains	P	X	P	X	P	P	A	P P P	P P			
Opaque Mineral Grains	P	P	P	P	P	P	X	P P P	P P			
Aggregates	A	A	X	P	P	P	P	X P X	X A			
Fly Ash								P				
Inorganic/Organic Fibers	P	P	P	P	P	P	P	P P P	P P			

APPENDIX B

OBSERVATIONS FROM THE CHESAPEAKE
BAY BRIDGE TUNNEL

This appendix describes water and surface characteristics observed from the Chesapeake Bay Bridge Tunnel system.

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Reference map of Chesapeake Bay entrance showing mile markers on bridge, high-rise bridge (B1) and the Fisherman's Island Bridge (B2).

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Monday, October 6, 1980

Time	Tide	Side	Mile	Wind	Comments
0830	5 hr before MLW	OC-1	I1 (3.8)	N-NE 20-25	Conditions: very choppy 0.2 to 0.3 m (0.5 to 1 ft), patchy clouds, windy, foam around island (22)
		OC	I2 (5.1)		Whitecaps and foam patches
		OC	I3 (9.0)		Whitecaps only in bay
		OC	I4 (10.4)		Foam around island, whitecaps mostly on bay side
		OC	(12.2)		Whitecaps and foam both sides
		OC	C2 (14)		Whitecaps
0850		OC	B2		Roughness lines by northern inlet, parallel to beaches
0855		T	(19.0)		Turn around
0900		Bay	B1 (15.3)	N-NE 20-25	Clouds causing green patches
		Bay	C2		Whitecaps and foam on both sides, 0.3 to 0.6 m (1-2 ft) swells
		Bay	I3		Whitecaps primarily bay side
		Bay	C1		Whitecaps both sides
		T	I2		Whitecaps on both sides; turn around foamline off end of island (23)
0915		OC			Waves, 0.3 to 0.6 m (1-2 ft)
0927		OC	B1		Faint irregular foamlines perpendicular to bridge, better developed on bay side
0931	4 hr before MLW	T2	19		Turn around

(Continued)

Monday, October 6, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
0935		Bay	B1		No foamlines noticed
0946		T	I2		Turn around
1007		OC	B1	N-NE 20-25	Foamline perpendicular to north end of bridge
		OC	B2		Foamline: parallel to shore before B2, associated with inlet
1011		T	I9		Turn around
		Bay	B1 (15.7)		Turbidity change; green-blue on north, brown-green on south(26)
		Bay	14.1		Shoals
		T	I2		Turn around
1034	3 hr before MLW	OC	C1		Large waves, 0.6 to 0.8 m (2-2.5 ft)
		OC	B1		Foamline
1046		T	I9		Turn around
1051		Bay	B1		Faint foamline north of B1
1054		Bay	12.5		Color change in water due to clouds: brown on north, green- blue on south (27)
1104		T	I2	N-NE 20-25	Turn around
		OC	B1		No foamline
1121		T	I9		Turn around
		Bay	B2		
		Bay	B1		Whitecaps
		Bay	7		Waves, 0.3 to 0.6 m (1-2 ft)

Monday, October 6, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1139	2 hr before	T	I1	N 20-25	Turn around
1215		OC	I2		Fewer clouds
		OC	I3,I4		Ocean side calmer than bay side
1227		OC	B1		Large meandering line on bay side; too much glare ocean side (north)
1232	1 hr before MLW	T	I19		Turn around
		Bay	B2		Blue channel water trending offshore (28,29)
1237		Bay	B1		Turbidity change; water color: brown to north, green on south; color gradient to blue channel water (30,31)
1242		Bay	I4 (10.7)		Turbidity change; blue water on south, brown water on the north irregular trend toward 30°N(32);
		Bay	I2		Foamline parallel to bridge, concave west; brown on east, blue on west
1250		T	I2		Foamline around island, waves of 0.3 to 0.6 m (1-2 ft)
1255		OC	I3		Calm on ocean side; whitecaps on bay side
		OC	I1		Turbidity change; blue on south, brown on north
		OC	I2		Turbidity change; brown on north, blue on south
		OC	I2.8		Foamlines thin, 0.3 m (1-ft) wide
1302		OC	B1 (15.4)	N-NW 20-25	Turbidity change: brown on north, blue on south
		T	19		Turn around

Monday, October 6, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1312		Bay	B1 (15.1)		Very wide brown band under bridge; irregular boundaries, foamline (34)
1315		Bay	12		Turbidity change; weak boundaries, brown on north, blue on south
		Bay	11.2		Turbidity change; brown to the north and blue to the south; boundaries sharpest on south side (35)
		Bay	I4		Whitecaps on bay side and calm on ocean side
		Bay	I3		Very distinct blue water lines parallel to bridge; brown on east side
		T	I2		Turn around
1329	MLW	OC-5	C1		Foamlines trending 65°SE; brown on south, blue on north
1333		OC			Turbidity change; wide brown band
		OC	12.5		Foamlines trending 75°SE (36)
1337		OC	15		Rows of brown bands, perpendicular on north side of bridge
1344		T			Turn around
		Bay	B1		Turbidity change; brown by shore, blue by north ramp to B1
		Bay	15.3		Irregular brown boundary with whitecaps under bridge (36)
1349		Bay	14.1		Shoals, swell and whitcaps (37)
		Bay	13		Foamlines trending 80°NW
		Bay	11.9		Turbidity change; brown on north
1354		Bay	I4 10.4		Turbidity change; brown on north, trending 65°NW

Monday, October 6, 1980 (Concluded)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	I3		Turbidity change; blue channel water with irregular boundary separating; green-brown on south
		Bay	I1		Turbidity change; water in channel is blue, water at margins of channel is green-brown

Tuesday, October 7, 1980

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
				NW 5-10	Conditions: calm seas 0.2-m (0.5-ft) waves, few clouds
		OC	1		Roughness change; calm water at 40° SW to land
		OC	11		Roughness change; water on south rougher than water on north
0915	5 hr before NLW	OC		NW 0-5	R/V <u>Linwood Holton</u>
		OC	8.5		Foamline meanders perpendicular to road
		OC	13		Slick, curves NE-SW into channe
0945		OC			Fishing boat on rocks (4,5)
		OC	11.4		Foamline, trending 45°SW, large meanders
		OC	11.7		Foamline, trending 45°SW, large meanders
		OC	12.4		Foamline, trending 45°SW, large l meanders
0955		OC	B1 (15.6)		Foamline; meanders and foam parallel to shore (8,9)
		OC	B2		Slicks
0959		T	19	NW 0-5	Turn around
		Bay	B2		Slick; smoother parallel to roa
	Ebb	Bay	B1 (15.4)		Boat wake (10)
		Bay	12.4		Turbidity change; brown on nort blue on south; large irregular meanders (11)

(Continued)

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	11.6		Foamline trending 40°NW, on both sides of bridge
		Bay	10.8		Foamline on ocean side trending 30°SE
1010	4 hr before MLW	Bay	I4		Slick; perpendicular and curves to I4 into channel
		Bay	I3 C1		Slick; meandering trend
1013		Bay	C1 8.4		Foamline; meandering trend at 60°SW, on ocean side
		Bay	I2		Roughness change; rough north of I2 and smooth south of I2
1020		Bay			Slick; west side of I2(I2)
1022		T	I1		Turn around; roughness line(13)
1024		OC	I2 6.6		Slick: 9-m (10-yd) wide, trending west
1026		OC	8.7		Foamline: NE around I3, calm on west side, rougher east side, wide foamline (14)
		OC	I4		Slick; calm around channel
		OC	11.8		Foamline: trending 30°SE, with large meander
		OC	12.3		Foamline perpendicular to bridge
1031		OC	12.5		Foamline; darker water south side (15)
1034		OC	15.5		Foamline north of B1
1039		T	19		Turn around
		Bay	B2		Slick perpendicular to channel sides

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1044		Bay	B1 (15.5)		Foamline: large line, rough on north side, calm on south side, perpendicular to channel (17)
		Bay	12.6		Foamline: thin, darker brown to north, large irregular meanders
		Bay	12.3		Foamline: thin
		Bay	I2		Foamline: rough on south side, trending NW
1050	Ebb	Bay	I3		Foamline on ocean side, parallel to road, <u>Holton</u> and helicopter near I4
1103	3 hr before MLW	T	I2	NW 0-5	Turn around
		OC	I2		Roughness change: rough on east side of line, trending 20°NE
		OC	C1		Roughness change: parallel to road, calm by bridge and rough eastward
		OC	I3 8.6		Foamline trending 30°NE
		OC	I4		R/V <u>Linwood Holton</u>
		OC	12.4		Foamline perpendicular to road, meandering trend at 40°NW
		OC	14.8		Foamline perpendicular to road, rough on north side
1118	Ebb	OC	B1		Foamline perpendicular to road, meandering trend (19)
		OC	B2		Foamline and slick by inlet
1122		T	19		Turn around
		Bay	B2		Foamline from fish nets
		Bay	B1 (5.4)		Foamline perpendicular to road, dark (20)

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1127		Bay	14.6		Slick: wide, perpendicular to road
1130		Bay	12.4		Foamline: perpendicular to road meandering trend on north
		Bay	I4		R/V <u>Linwood Holton</u> (21,22)
1145	Ebb	Bay	C1 (8.6)		Foamline: perpendicular to bridge, rough on south side
1150		T	I1		Turn around
1225	2 hr before MLW	OC	I3 8.7		Foamlines perpendicular to bridge, trending NE
		OC	I4		Foamline around I4
		OC	10.8		Rough patch; off to east
		OC	12.8		Helicopter
		OC	C2 13.5		Foamline trending 30°SE
		OC	14.5		Foamline and roughness changes
		OC	B1 (15.5)		Foamline perpendicular to road
1232		OC	16.2		Slick around channel
1235		T	19		Turn around
		Bay	B1 (15.3)		Foamline, with color change (3)
		Bay	14.9		Foamline and roughness change (4)
		Bay	14.0		Foamline and roughness change; brown on north, green on south(5)
1246		Bay	I4		Roughness line change
			I3		Roughness change; rough NW into channel
			6.2		Slick: irregular pattern, brown color

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1255		T	I2		Turn around; rough band parallel to channel
		OC	I3 (9.0)		Rough band trending NE into channel
1305	1 hr before NLW	OC	I4	N-NW 0-5	Roughness band perpendicular to road and bends to the NE
		OC	13.0		Turbidity change: bands of blue and brown water (R/V <u>Holton</u> and helicopter)
		OC	14.1		Foamline; large meanders, bands of color change
1311		OC	15.4		2 foamlines perpendicular to bridge, small meanders
1315		T	19		Turn around
		Bay	B1		Foamline and turbidity change; brown water on north side and green water on south side; large meanders (13,14)
		Bay	15.3		
		Bay	14.1		Rough patch perpendicular to bridge
		Bay	13.4		
		Bay	12.3		Roughness patch perpendicular to bridge
1326		Bay	11.6		Foamline trending 30°SW and curving to the west
		Bay	10.9		Roughness band trending 30°SW into I4 channel
		Bay	C1		Roughness band trending 30°NW into I3 channel
1335		Bay	I2		Roughness band before I2 and curving around island into channel

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		T	I2		Turn around; slick meandering in channel
		OC	7.7		Roughness band east of road (15)
		OC	10.9		Foamline perpendicular to bridge, roughness band, calm on west side
1345		OC	12.3		Turbidity change: perpendicular to bridge, brown water on north side, green water on south side
1350		OC	15.1 15.4		Foamline perpendicular to road with faint meandering slicks
1354		T	19		Turn around
		Bay	15.6		Foamline perpendicular to bridge; small meanders
		Bay	15.3		Foamline and slicks perpendicular to road, meandering trend
1401		Bay	14.1 C-2	ESE	Roughness band and slicks perpendicular to road
		Bay	12.3		Slick: two bands perpendicular to road; straight trend (16)
		Bay	12.8		Slicks: irregular
1406	MLW	Bay	I4		Slick: large meandering
		Bay	C1		Slick: irregular shape
		Bay	I2		Slicks: irregular shape near I2
1421		T	I2		Turn around, slicks; trending 80°SE into I3
1426		OC	I3		Roughness lines parallel to channel, calm on south side
		OC	I4		Slicks in evenly spaced rows
1433		OC	13.9		R/V <u>Holton</u> and helicopter; slick and color change (evenly spaced); brown water on north side, blue water on south side

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1435		OC	B1		Slick in center of channel
1438		T	19		Turn around
		Bay	B2		
		Bay	B1		Slicks center of channel
		Bay	C2		Slicks
1447		Bay	11.9		Slick: wide and perpendicular to road
		Bay	10.8		Slick: trending 70°SW into channel
1455		Bay			Roughness change: calm east of I3 (20)
		Bay	7.5		Slicks: (2) irregular trending meander, perpendicular to road
		Bay	6.5		Slicks: trending 30°SW
		Bay	5.9		Slick: irregular shape, perpendicular to road
		T	I2		Turn around
		OC	I2		Slicks: parallel to channel; faint row trending 80°SE
1509	1 hr after MLW	OC	I3	E 5-10	Slick at channel mouth
		OC	I4		Slick perpendicular to road and curving parallel to channel
1518		OC	B1		
		OC	B2		Slicks
1521		T			Turn around
		Bay	B2		Foamline perpendicular to road, calm on north side, clouds to west

Tuesday, October 7, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	B1		Slicks east of fish fence
		Bay	15.3		Slicks perpendicular to road, meanders south of B1
1528		Bay	C2 (14)		Slick perpendicular to road with small meanders
		Bay	12.4		Roughness bands perpendicular to road
		Bay	11.6		Slick perpendicular to road
1532		Bay	I4		Roughness band rough on north channel
1535		Bay	I4		R/V <u>Holton</u> and 2 boats; slick between channel to C1 (21,22)
		Bay	7.3		Slick perpendicular to road with large meander
		Bay	5.7		Slicks: one perpendicular to road, one trending 50°SW
1549		T	I2		Turn around; slick perpendicular to road and one slick parallel to channel
1555	Flood	OC	I3		Slick perpendicular to road
		OC	11.5		Slick perpendicular to road, small meanders
		OC	13.7		Slick perpendicular to road, long meanders
		OC	13.9		Foamline perpendicular to road
1602		OC	B1	E 5-10	Slick perpendicular to road, broad band
1605	2 hr after MLW	T	19		Turn around
		Bay	13.7		Slicks perpendicular to road, channel around I4

Tuesday, October 7, 1980 (Concluded)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1615		Bay	I4 10.8		Slicks trending 30°SW into channel around I4
		Bay	I3		Slick between channel and C1 around I3
1620		Bay	7		Slick perpendicular to road, slight meander

Wednesday, October 8, 1980

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
0921		OC		W 5-10	Sunny, no clouds, hazy, sea calm
0953	5 hr before MLW	OC	12		
		OC	6.1 to 7.0		Foamline parallel to road, becoming indistinct, post mile marker 7.0
1000		OC	8.0 to 8.4	SW 5-10	Foamline concave west, meanders forming half circle
		OC	14		Roughness change; rough area parallel and 201 m (220 yd) east of road
		OC	11.6		Foamline perpendicular to road, large meanders, rough on south
1013		T			Turn around
		Bay	11.8		Foamline perpendicular to road, large meanders, rough on south, blue water on south side and green water on north side
1025		Bay	14		Left 14 at 1035
		Bay	13		Roughness line; large meanders, calm in channel, rough to the south
1040		T			Turn around; colliers parallel to road, sea 0.3 m (1 ft)
1045	4 hr before MLW	OC	12		Roughness bands: 1st band parallel to channel, 2nd band parallel to road, 183 to 274 m (200-300 yd) east, rough on east
1050		OC	13		Foamline; large meanders trending 20° SE
		OC	14		Roughness band parallel to road
		OC	B2	Southerly	

(Continued)

Wednesday, October 8, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1102		T	19	SW 5-10	Turn around
		Bay	B1		Slick off pier on Fishermans Island
1111		Bay	12.3		Turbidity change; boundary perpendicular to road in large meanders; water on north side green, water on south side blue
1116		Bay	I4		Roughness bands parallel to road; ocean side disappears into channel; R/V <u>Holton</u> east on I4
1126		T	I2		Turn around
		OC	C-1		Roughness band parallel to road, from I3 into channel
1136		OC	12.6		Foamline perpendicular to road; blue water on south side, green water on north side
		OC	B2		Foamline in center of channel with large irregular meanders
1145	3 hr before MLW	T	19		Turn around
1150		Bay	B-1 to 15.6	B-1	Roughness band perpendicular to road and north of B-1; blue water on north side, green water on south side
		Bay	14.8		Roughness band perpendicular to road
1154		Bay	12.6		Turbidity change; no formline, perpendicular to road, big meanders; green water on north side, blue water on south side (6)
1205		Bay	I1	SW 5-10	Lunch
1240	2 hr before MLW	T	I1		Turn around, ships 50°NE

Wednesday, October 8, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1255		OC	13.4		Foamline (weak); color change-- brown water on south side, blue water on north side; picture of <u>Holton</u> (10)
1258		OC	15.4 to B-1		Foamline perpendicular to road, small regular meanders
1303		T	19	SW 5-10	Roughness band and turbidity change perpendicular to road; brown water on south side, blue water on north side; capillary waves south only(11)
		Bay	14.0		Turbidity change perpendicular to road; brown water on south side, blue water on north side; capillary waves in brown, large meanders water (12)
1323		T			Turn around; ships face bridge trending 70-80°NE
1337		OC	14.1		Turbidity change perpendicular to road, large meanders; brown water on north side, blue water on south side
		OC	15.4		Foamline perpendicular to road; brown water to north, blue water to south, large meanders
1342	1 hr before MLW	T			Turn around
		Bay	15.3		Turbidity change perpendicular to road, brown water to north, blue water to south, large meanders; capillary waves to north
		Bay	13		Roughness line; brown water to east, blue water to south
		Bay	11.7		Foamline: brown water to north, blue water to south

Wednesday, October 8, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	I4		Roughness band perpendicular to road
		Bay	I-3		Slick: around I3 trending 30°NE into channel meanders
1405	T	I2		SW 5-10	Turn around; ships at I2 perpendicular to road
	OC	I3			Roughness band perpendicular to road, calm in channel, rough to north
	OC	12			Roughness band parallel to road
	OC	12.3			Turbidity change; perpendicular to road, green water to north, blue water to south, meanders (14)
1415	OC	13.4			Picture of R/V <u>Holton</u> (15)
	OC	14.1			Turbidity change perpendicular to road, brown water to north, blue water to south
	OC	B-1 to 15.5			Roughness band perpendicular to road; brown water to north, blue water to south(16)
1420	OC	15.8			Fishermans Island
1425	T	19			Turn around
	Bay	14.1			Turbidity change perpendicular to road, brown water to north, blue water to south; capillary waves in brown water area
1434	Bay	12.3			Turbidity change perpendicular to road, brown water to north, blue water to south
	Bay	I3			Roughness band: rough on east, calm on west
1441	Bay	6.6			Slick trending 50°SW, large meanders

Wednesday, October 8, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1443	MLW	Bay	12		Rest stop
1500		T	12	WNW 10-15	
		OC	8.7		Roughness band trending 60°SE
1508		OC	14		Roughness band parallel to road, calm to north, large meanders
		OC	12.2		Roughness band; perpendicular to road, brown water to north, blue water to south
1512		OC	14.3		Color change perpendicular to road, brown water to north, blue water to south
1519		T	19		Turn around
1524		Bay	B-1 to 15.3		Turbidity change perpendicular to road, green water to south, blue water to north, some foam
		T	13		
1531		OC	10.7		Slick; concave south trend
		OC	12.8		Roughness band trending NE
		OC	14.2		Roughness band trending 50° NE(23)
		OC	14.7		Roughness band trending 50°NE parallel to road
		OC	15.2		Roughness band perpendicular to road, bands NE
1543	1 hr after MLW	T	19	W 5-10	Turn around
		Bay	B-1 to 15.3		Roughness band perpendicular to road, rough on south, relatively strong boundary

Wednesday, October 8, 1980 (Concluded)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	14.1		Slick perpendicular to road sharp southern boundary
1612		T	I1		Turn around
1625		OC	I3		Slick in channel perpendicular to road
		OC	10.6		Slick perpendicular to road
		OC	14.0		Slick perpendicular to road
1631		OC	15.0 to 13		Roughness band around the Third Island
1718		T	I1	W 5-10	
1726		OC	I3		Slicks: irregular shapes
		OC	8.7		Slick perpendicular to road
1730		OC	11.3		Slick perpendicular to road
		OC	12.5		Slick parallel to road
		OC	13.7		Slick perpendicular to road
		OC	14.5		Slicks: widely spaced
1738		T	19		Turn around
		Bay	15		Slick perpendicular to road
		Bay	15.8		Slick: (two) perpendicular to road
		Bay	11.5		Slick parallel to road
1746		Bay	12.5		Slick trending 30°NW
1753		Bay	I3		Slick out of channel, bands SE
		Bay	I3		Roughness band from channel to SE
1758		T	I2	W 5-10	Turn around to check <u>ODU-1</u>

Thursday, October 9, 1980

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1100				W 5-10	Conditions: calm seas, hazy, no clouds
1231	3 hr before MLW	OC	I2		Slick trending 60°NE, meanders from I2
		OC	6-6.8		Slick parallel to road, meanders and turns out to sea
1240		OC	I3 (8.9)		Slick trending 50°SE, I3
		OC	I4		Slick trending SE into channel
		OC	10.9		Slick parallel to road
1244		OC	11.3		Foamline trending 80°SE
1245		OC	12.6		Foamline perpendicular to road with small meanders
1249		OC	B1		Foamline perpendicular to road with small meanders; roughness band farther east(31)
1253		T	19		Turn around
		Bay	B2		Slick perpendicular to shore, large meanders
		Bay	15.5		Slick perpendicular to road
		Bay	13.7		Turbidity change; brown water toward north, blue water toward south; trending 30°NW
1303		Bay	I4 (11.0)	W 0-5	Slick parallel to road, large irregular meanders
		Bay	I3 C1		Roughness band parallel to road from I3 to C1
		Bay	6.5		Foamline trending 30°SW
1311		Bay	5.6		Foamline trending 40°NW, patchy
		Bay	5.4		Slick perpendicular to road, meanders

(Continued)

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		T	I2		Turn around
1314		OC	I2		Slick perpendicular to road; meanders along channels (R/V Holton)
1319		OC	5.4		Slick perpendicular to road, small meanders
		OC	5.8		Foamline trending 40°SE
		OC	6.1		Foamline trending 40°NE, rough on east side
		OC	C-1		Roughness band parallel to road
1325	2 hr before MLW	OC	I3		Slick trending 40°NE, small meanders
		OC	I4		Different roughness: rough south and calm north
		OC	10.7		Slick trending 30°NE
1329		OC	13.1		Foamline perpendicular to road
		OC	14.0		Foamline trending 50°NE with slicks
		OC	14.0		Foamline trending 50°NE with slicks
		OC	15.4		Different roughness: rough on north side and calm on south
1335		OC	B2		Slick in SE channel and middle B2
1337		T	I9		Turn around
		Bay	B2		Slick: Y-shaped on mouth end of B2
		Bay	15.5 B1		Roughness band concave, north along coast and east from 13.2 to 14.5

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		Bay	14		Roughness band perpendicular to road, wide band over shoals, fomaline
1344		Bay	13.5		Roughness patches, concave south
		Bay	12.7		Roughness band trending 60°SW
		Bay	10.9		Roughness band parallel to road and 274 m (300 yd) west
1351		Bay	14		Foamline trending 45°SW, bends west into I4, concave east(34)
		Bay	7.0		Roughness band trending 30°SW, parallel to road farther south
1357		Bay	6.2		Roughness band parallel to road; slick (35) perpendicular to road with large meanders
		Bay	5.4		Foamline perpendicular to road, trending NW
		Bay	12		0.3-m (1-ft) waves
		T	12		Turn around; rough patches east side of T-2, along channel rough north side (36)
1407		OC	6.8	WNW 0-5	Roughness band parallel to road at 91 m (100 yd), slick perpendicular to road at I3
1412		OC	14		Roughness band out of channel, bends NE parallel to road
		OC	12.3		Foamline and roughness band perpendicular to road bends NE(O)
		OC	13.4		R/V <u>Holton</u> and helicopter
1419	1 hr before	OC	14		Foamline perpendicular to road, slight meanders
		OC	C1		Rough patches: rows of brown and green water

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
		OC	B1		Turbidity change; brown water to north, blue water to south, just before B1
		T	19		Turn around
		Bay	15.6		Roughness band along shore, calm to north, rough to south; south side has foam
		Bay	14.0		Foamline perpendicular to road small meander
1433		Bay	13.5		Roughness band 366 m (400 yd) west and parallel
1435		Bay	12.3		Foam and blue water to the south
		Bay	12.2		Roughness band; rough on north, calm on south, all blue meanders
		Bay	I3		Slick perpendicular to road, then parallel to channel
		Bay	C-1		Roughness change; bay calm, ocean rough
1443		Bay	5.7		Slick perpendicular to road, irregular shape, large meanders
		Bay	I2 (5.4)		Slick: broad and perpendicular to road, bends into channel
1407		T	I1	WNW 0-5	Turn around
1514		OC	I1		Roughness band 366 m (400 yd) east parallel to road
		OC	I2		Roughness band parallel to channels and road; ships perpendicular to C1(4,5)
		OC	10.7 to 12.0		Slick trending 60°NE, alternating rows of calm and rough water, straight and equal

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1527	MLW	OC	12.1		Slicks (two): 80°NE, meandering
		OC	13.7		Slick patch 457 m (500 yd) east of road
1529		OC	14.0		Slick perpendicular to road
		OC	B1		Turbidity change; alternating rows of rough green water and calm blue water
		OC	B1 15.4		Foamline and turbidity changes; brown water on north, blue water on south, large meanders just south of B1(6)
		OC	B1 15.5		2 slicks perpendicular to road, just north of B1
1535		T	B2		SW flats, very low water
		Bay	15.6 B1		Slick parallel to coast
		Bay	15.3		Foamline and turbidity change; brown water to north and blue water to south, small meanders
		Bay	15.1		Slick perpendicular to road, large meanders
		Bay	14.3		Rough patches: concave north at C2; irregular shape and faint slicks far west
		Bay	12.2		Roughness band: rough water on north, calm water on south
1545		Bay	12.1		Slick trending 60°SW
		Bay	11.0		Slicks meandering
		Bay	I3 8.9		Slicks parallel to channel
1554		Bay	6.4		Slick trending 50°NW, straight
		Bay	I2		Slicks meandering parallel to channel(7)

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1600		Bay	6.0	ESE 0-5	Slick trending 70°SE, small meander
1604		T	I3		Turn around; calm to east, patches and slicks irregular
		OC	11.0		Rows, calm then rough, small meanders (not on bay side)(8)
		OC	12.0		Slicks perpendicular to road, large meanders
1609		OC	14.0		Slick perpendicular to road (R/V <u>Holton</u>) (9)
		OC	15.0		Slick perpendicular to road, small meanders
1612		OC	15.6		Slicks (three): follow trend to coast, small meanders
		OC	B2		Slick perpendicular to north end of bridge
		T	19		Turn around
1615		Bay	15.6		Slicks perpendicular to shore
		Bay	15.2		Slicks and foamline; splits west
		Bay	14.0		Roughness bands perpendicular to road with slicks
1624		Bay	12.4		Slicks perpendicular to road
		Bay	12.0		Slicks perpendicular to road
		Bay	10.8		Slick perpendicular to road with meanders
1626	1 hr after MLW	Bay	I4		Calm both sides I4

Thursday, October 9, 1980 (Continued)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1631		Bay	6.4		Slicks trending 70°NW, two slight meanders
		Bay	5.8		Slicks perpendicular to road, then bend SW to I2
1634		Bay	I2		Slicks in channel, trending 45°SW
		T	I2		Turn around
		OC	I2		Slick parallel to channel
		OC	6.3		Slick trending 60°SE, irregular meanders
		OC	I3		Slicks alternating rough and calm bands
1655		OC	I3		Slick perpendicular to road; also, irregular slicks parallel to channel
		OC	I4		Slick perpendicular to road
		OC	12.4		Slick parallel to channel
		OC	12.5		Slick perpendicular to road, irregular shape
		OC	14.7		R/V <u>Holton</u> (13/14)
1702		OC	B1	SSE 5-10	Slick perpendicular to road
		OC	B2		Slicks: center of channel, trending NE
		T	19		Turn around
1713		Bay	C2		Slicks perpendicular to channel
			12.1		Slicks irregular and perpendicular to road
1716			11.8		Slicks perpendicular to road; rows on ocean side

Thursday, October 9, 1980 (Concluded)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
			I3		Slicks: large irregular slicks perpendicular to road
			6.3		Slicks trending 50°NW
1718			6.0		Slicks perpendicular to road
			I2		Slick perpendicular to road
1720			I1		Slick perpendicular to road, meanders around fishing pair
			2.7		Slicks (two): perpendicular to road, large meanders
1737	2 hr after MLW				Rows both sides perpendicular to road

Friday, October 10, 1980

Time	Tide	Side	Mile	Wind	Comments
		T		ESE 10-15	Weather: cloudy and hazy
1232	4 hr before MLW	OC	1.7		Slick perpendicular to road
		OC	2.2		Slick perpendicular to road
1241		OC	8.0		Slick trending 40°SE, large meanders
1245		OC	I-4 to 10.6		Roughness band; calm on west side
		OC	12 to 15		Waves of 0.5 m (1.5 ft)
1250		OC	15 to B1		Slick trending 70°NE
		OC	17.8		Foamline perpendicular to road
1254		T	19		Turn around
		Bay	B1 to 15.5		Roughness band; rough on north side
1300		Bay	15.0	ESE 10-15	Foamline: weak, perpendicular to road
1305	3 hr before MLW	Bay	I4		Slick trending 30°SW around Fourth Island
		Bay	I2		Roughness band on both sides of Second Island
1312		T	I2		Turn around
1318		OC	8.6		Foamline perpendicular to road
		OC	I4		Roughness band parallel to road and crosses road at 10.9 mile mark, calm on west
		OC	15.4		Foamline perpendicular to road, meanders

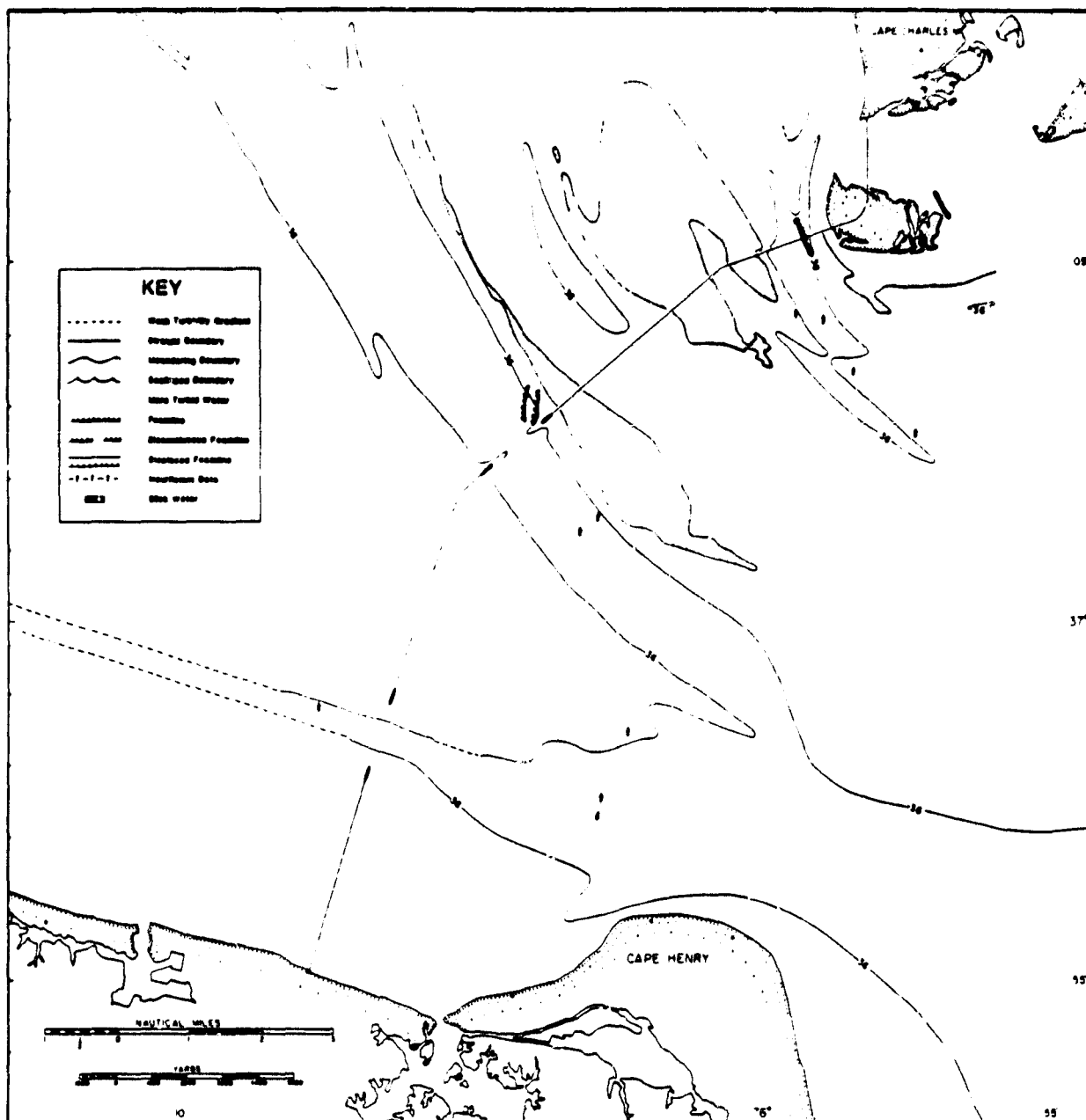
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Friday, October 10, 1980 (Concluded)

<u>Time</u>	<u>Tide</u>	<u>Side</u>	<u>Mile</u>	<u>Wind</u>	<u>Comments</u>
1330		OC	B2		Foamline perpendicular to road
1331		T	19		Turn around
		Bay	17.7 to B2		Foamline perpendicular to road
1336		Bay	15.3		Roughness band perpendicular to road, calm on south
		Bay	I4		Waves less than 0.3 m (1 ft)
1347		T			Turn around
		OC	I3		Roughness band parallel to road
1344		OC	8.8		Slick: weak trending 30°NE
		OC	I4		Foamline parallel to road, extends (0.5 m) north of the Fourth Island
		OC	15.2		Foamline trending 50°NE, large meanders
1407	2 hr before MLW	T	19	ENE 10-15	Turn around
1411		Bay	15.1		Roughness change perpendicular to road, north side rough and dark, south side calm
1417		Bay	I4		Slick parallel to road
1423		Bay	I2		Slick parallel to road

DATE 10-6-80

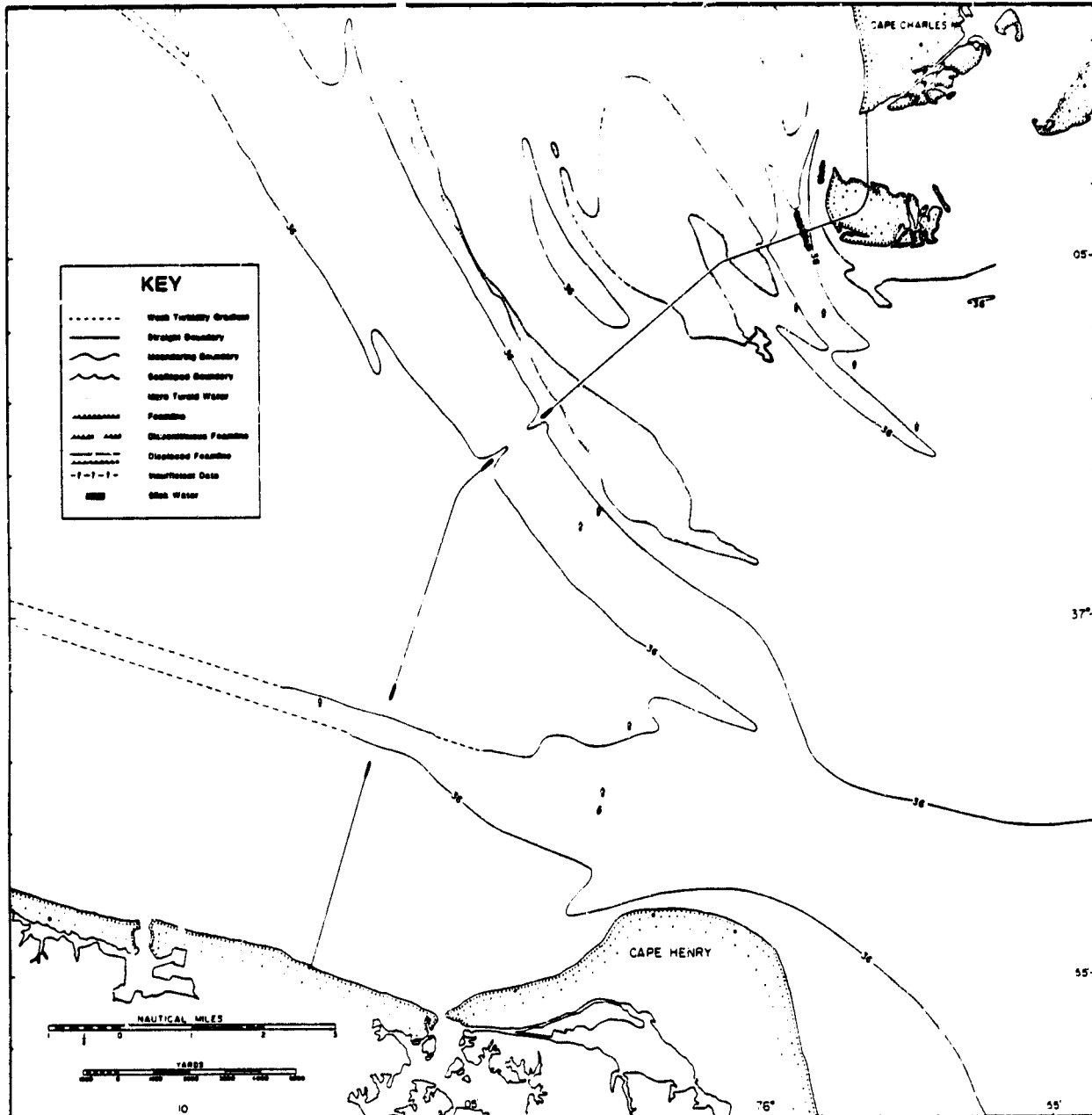
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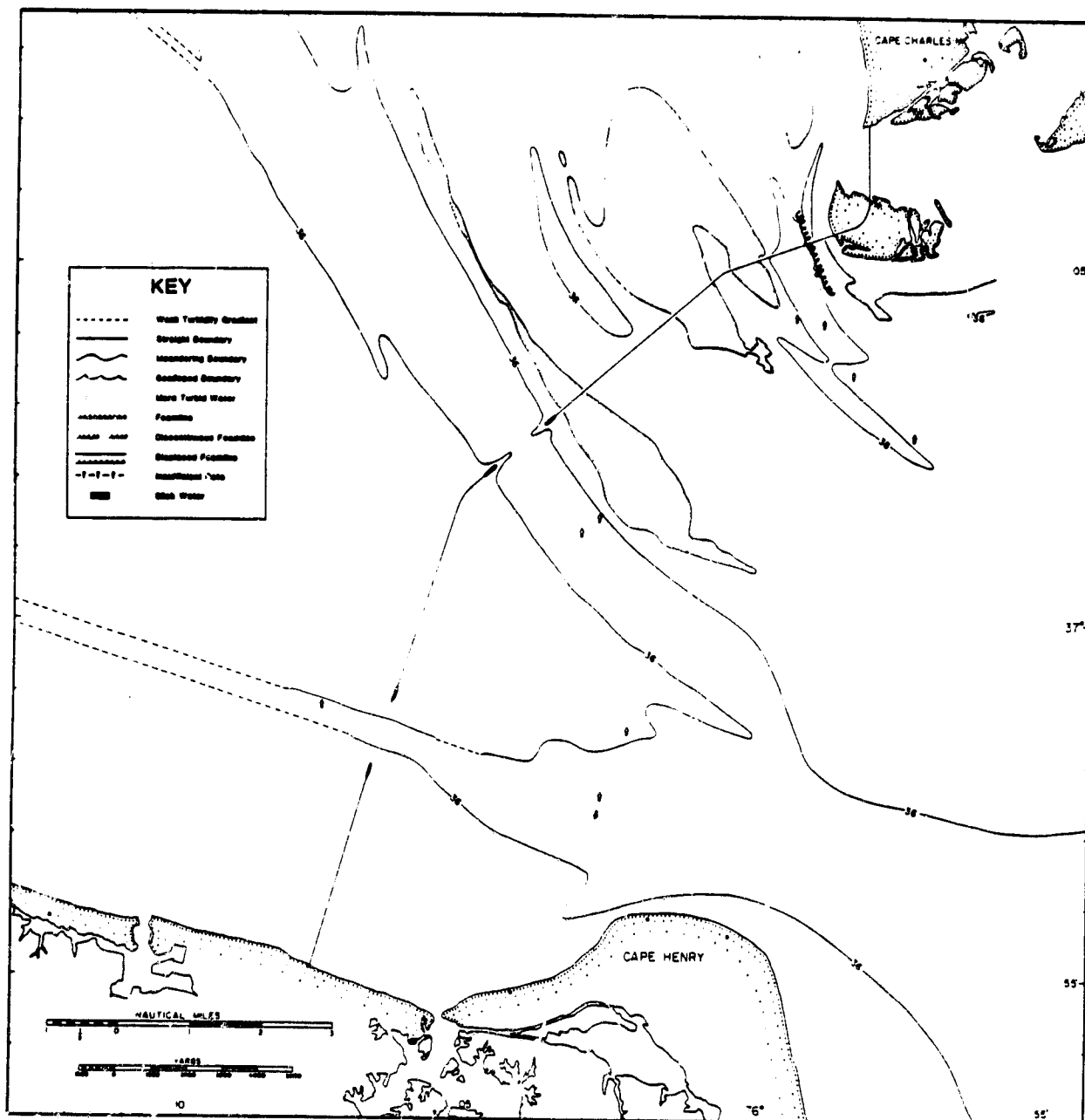
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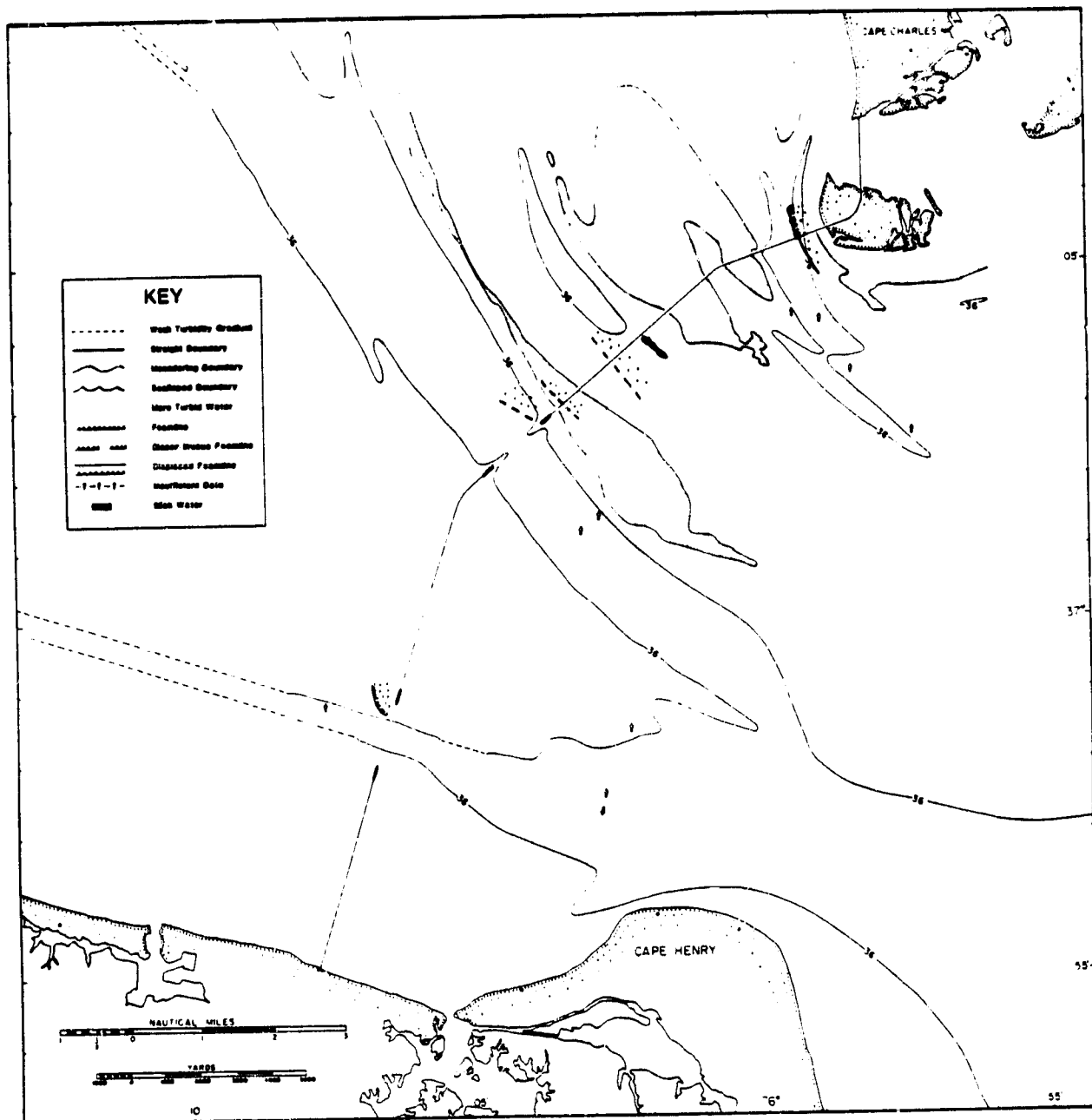
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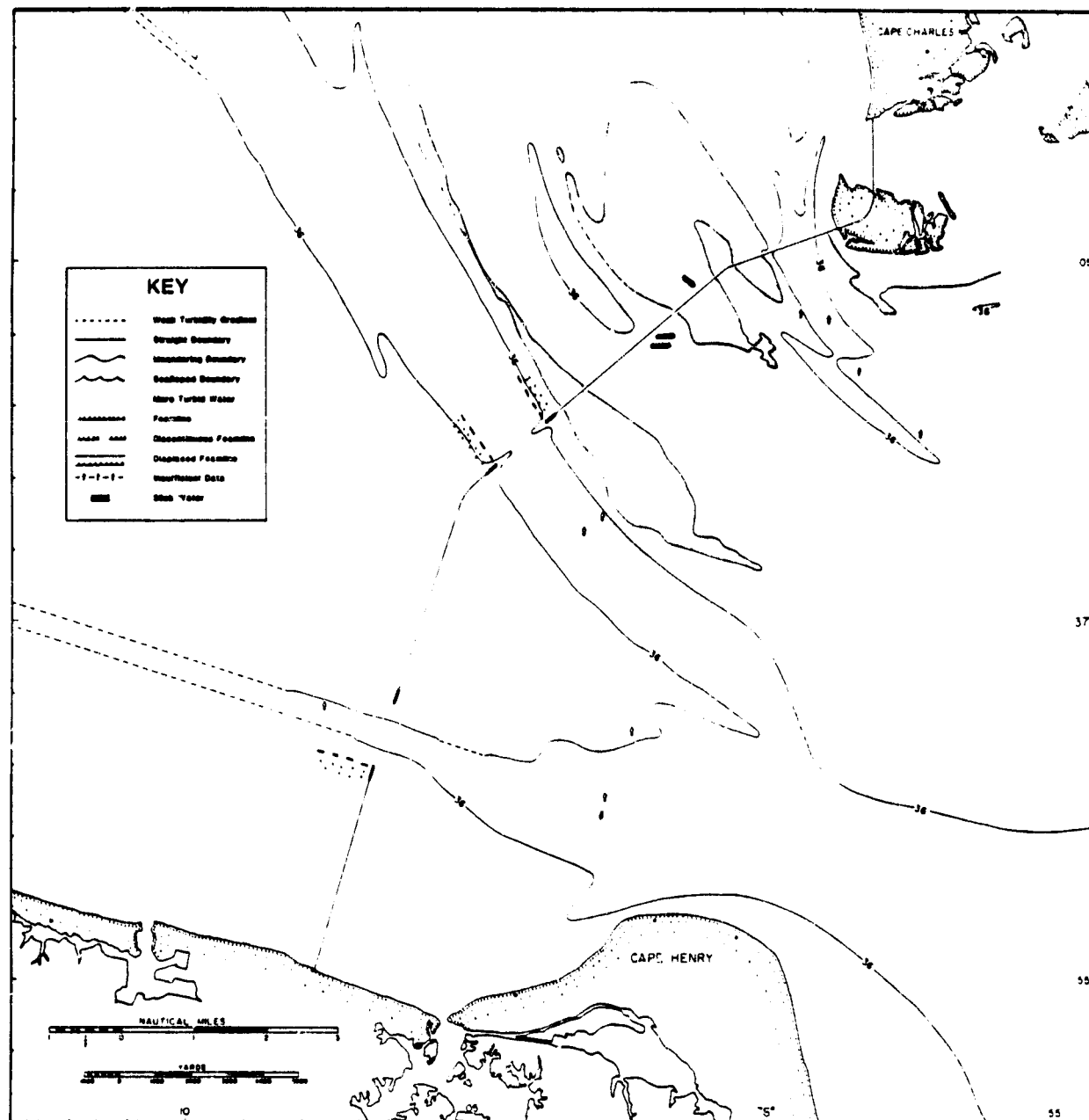
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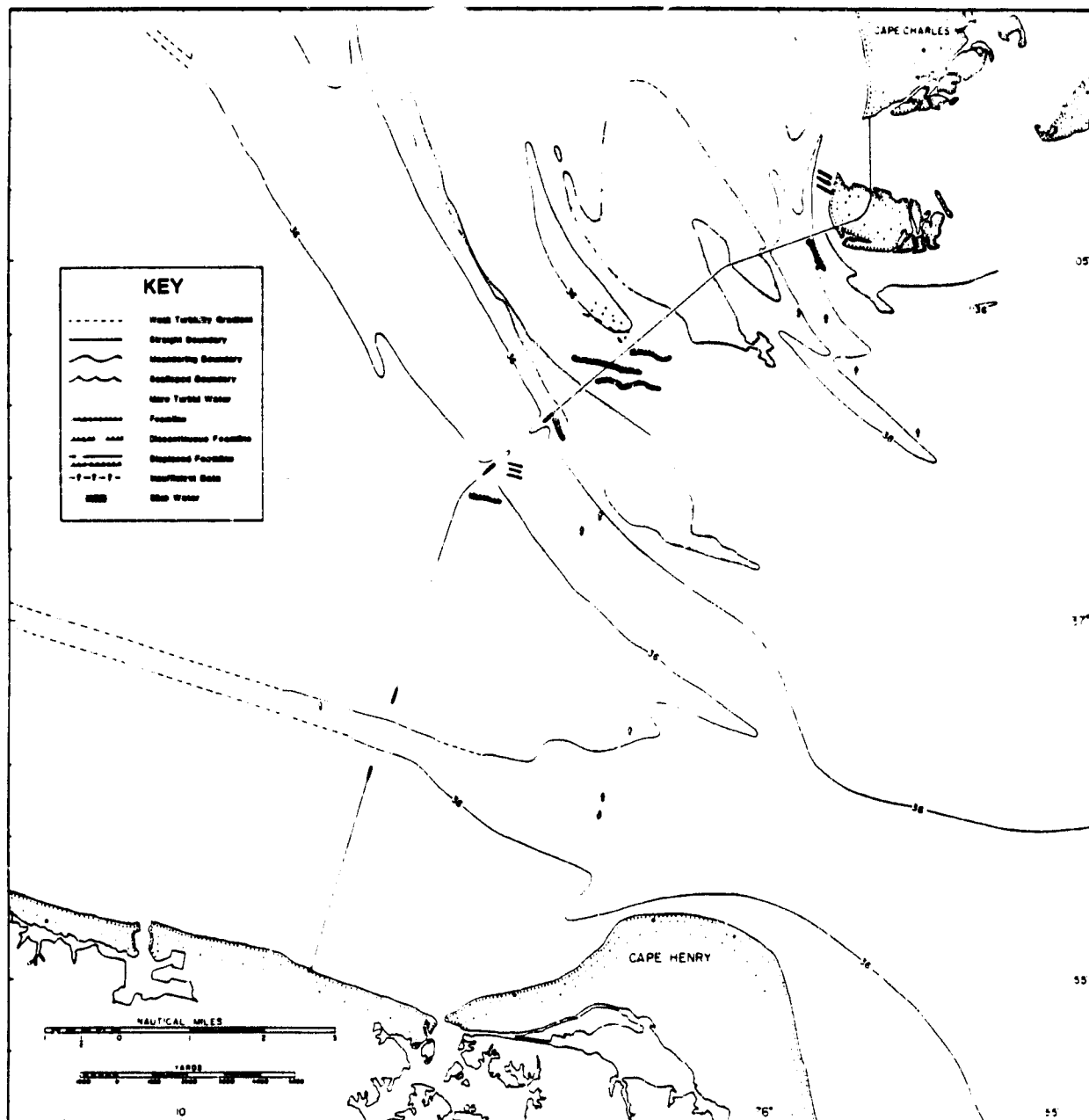
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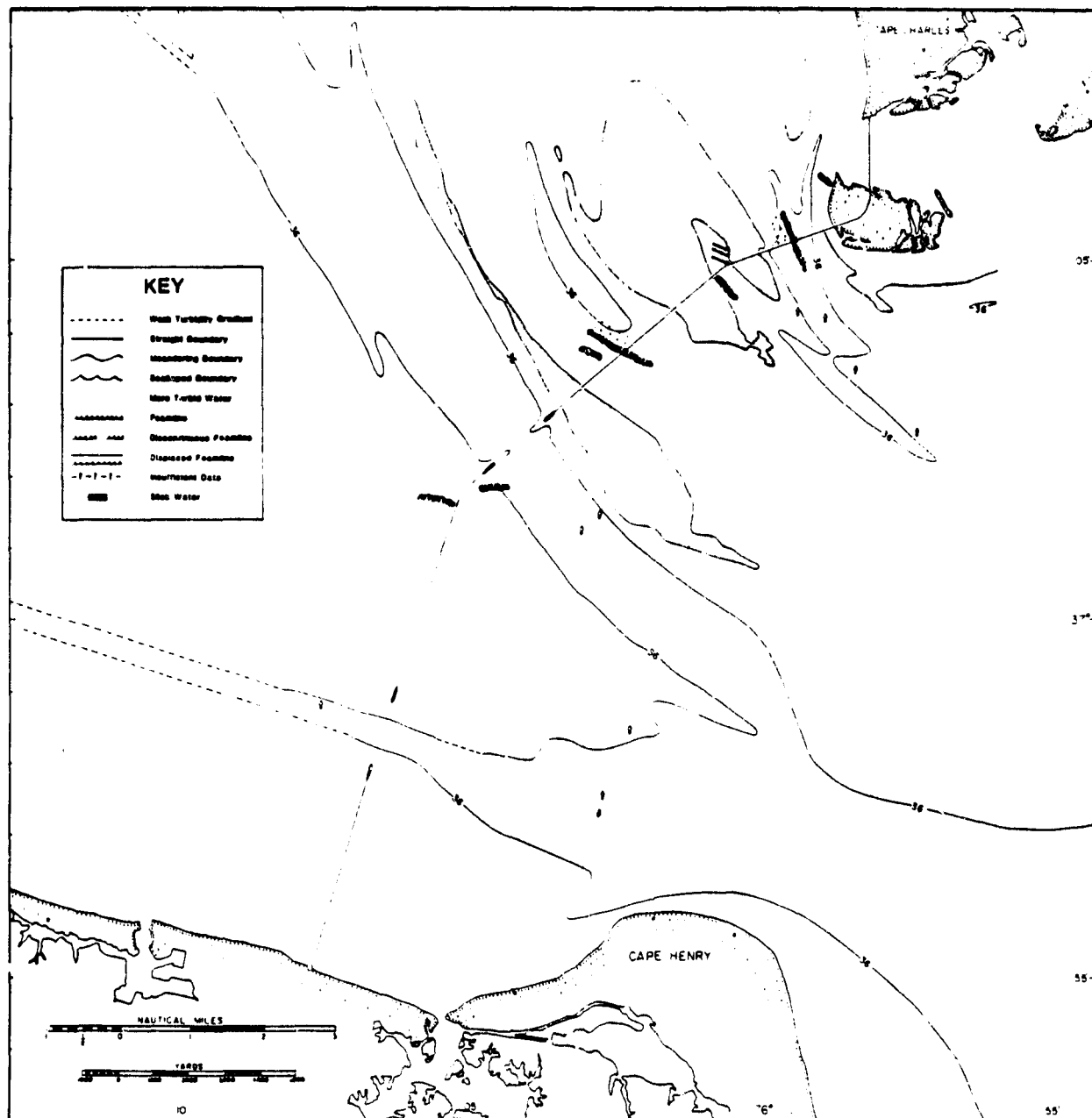
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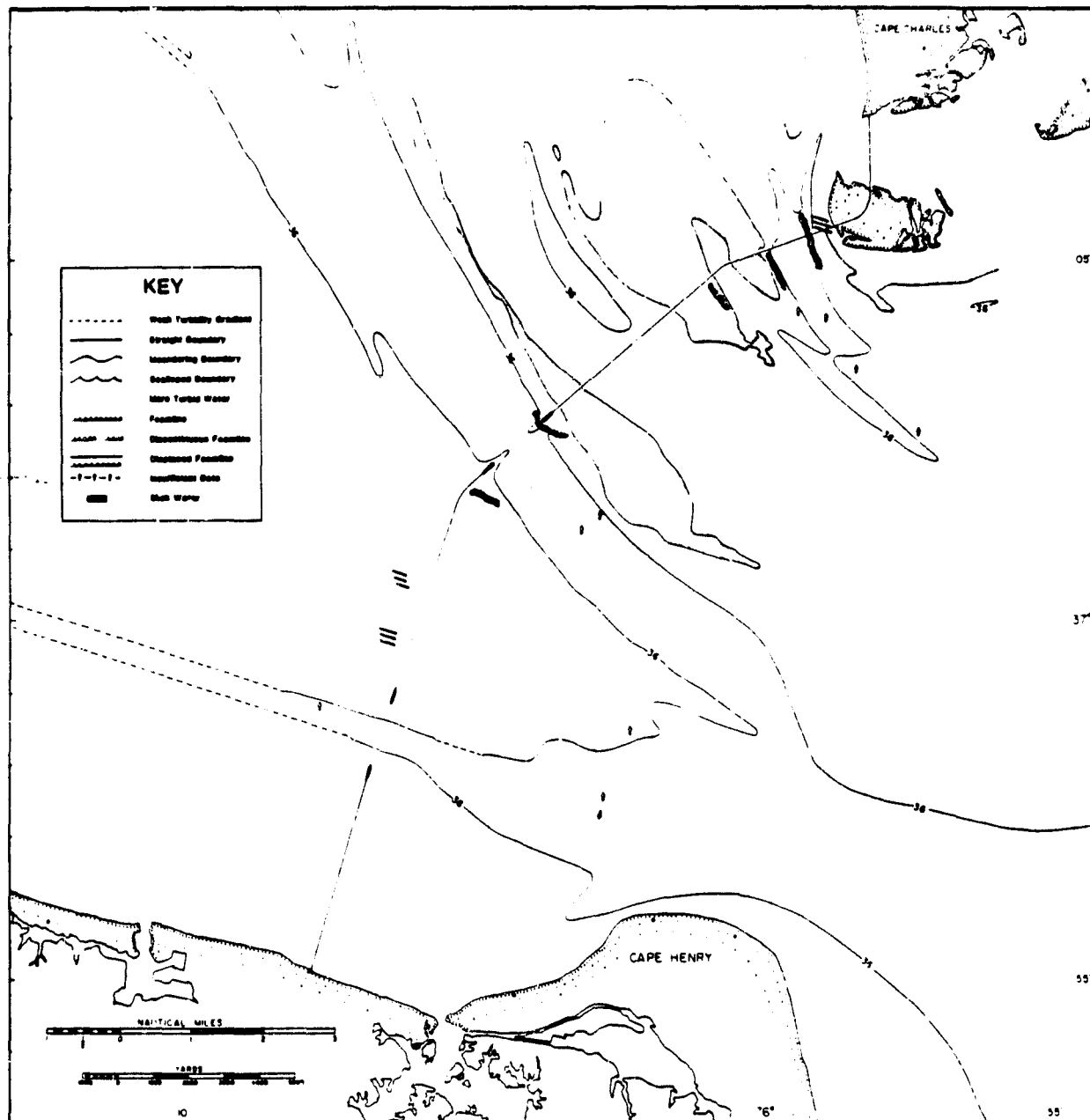
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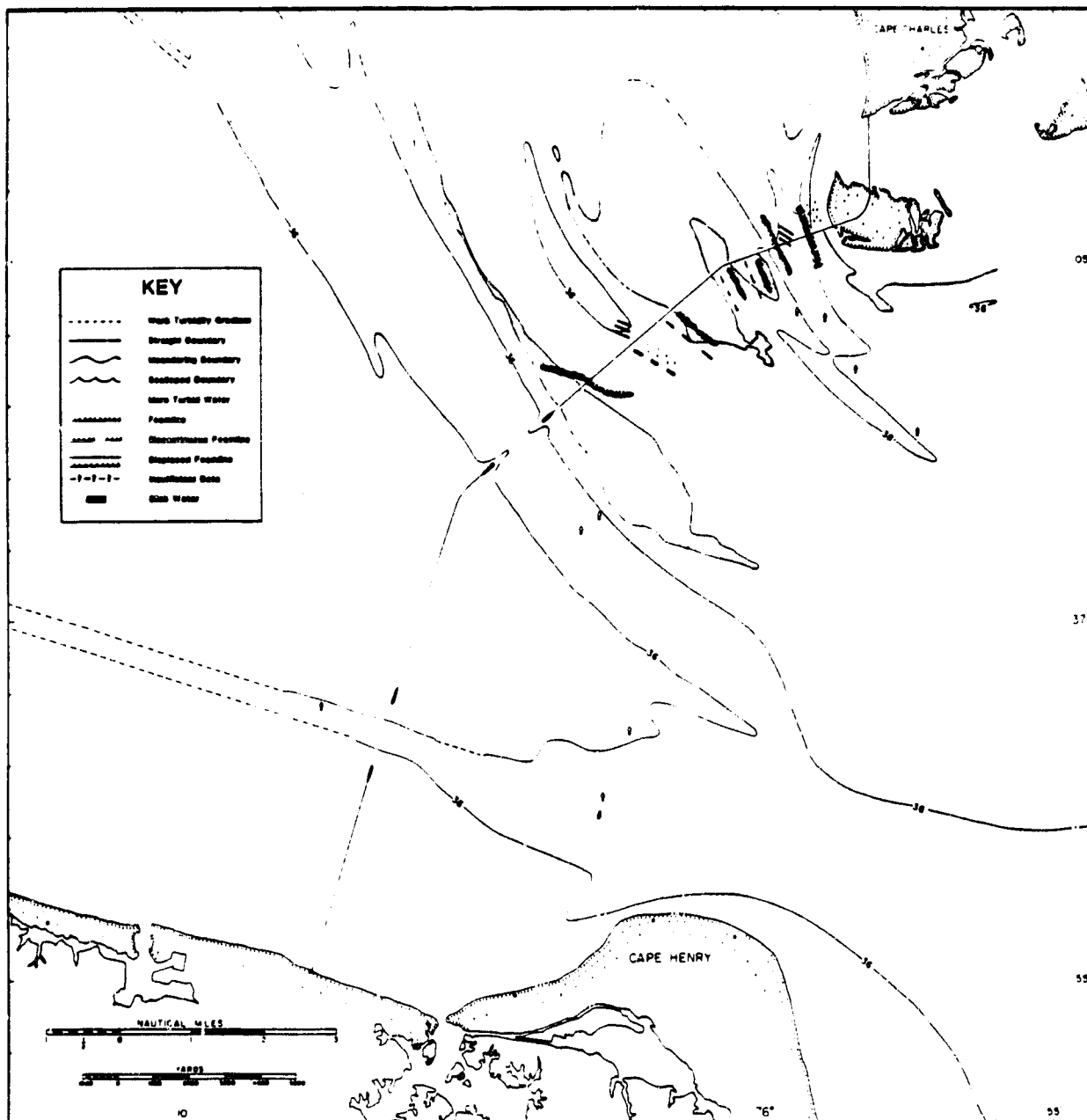
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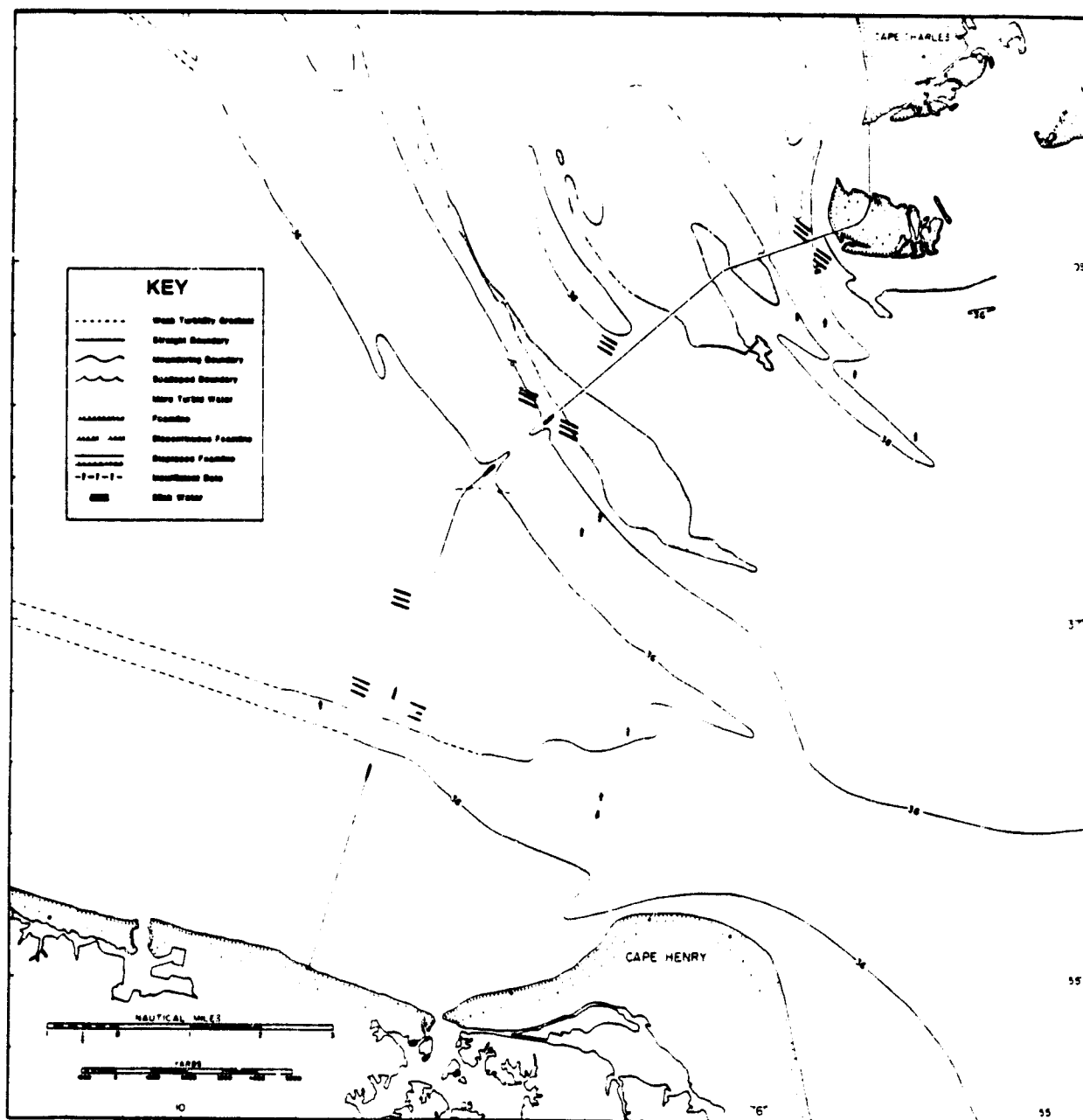
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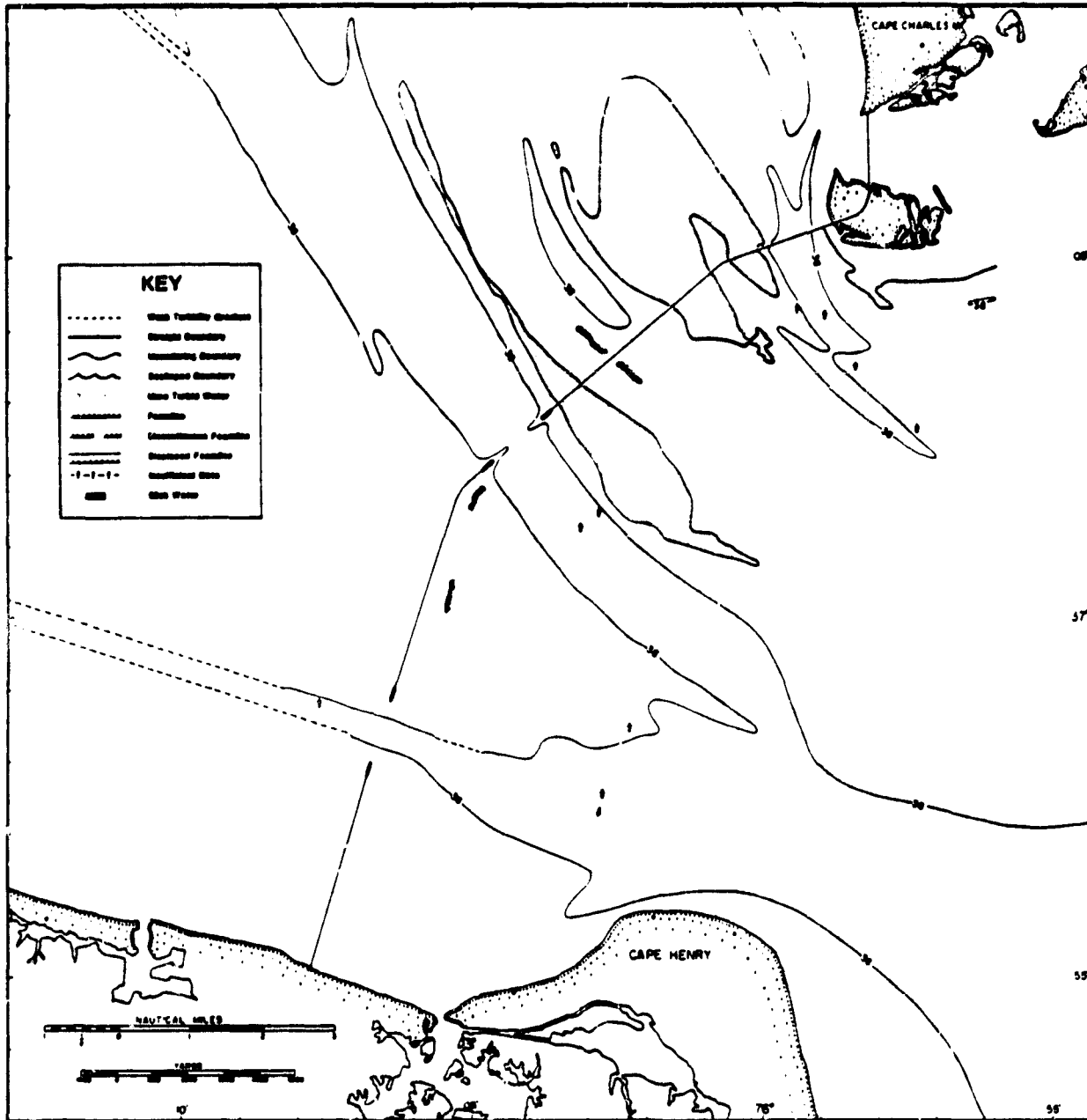
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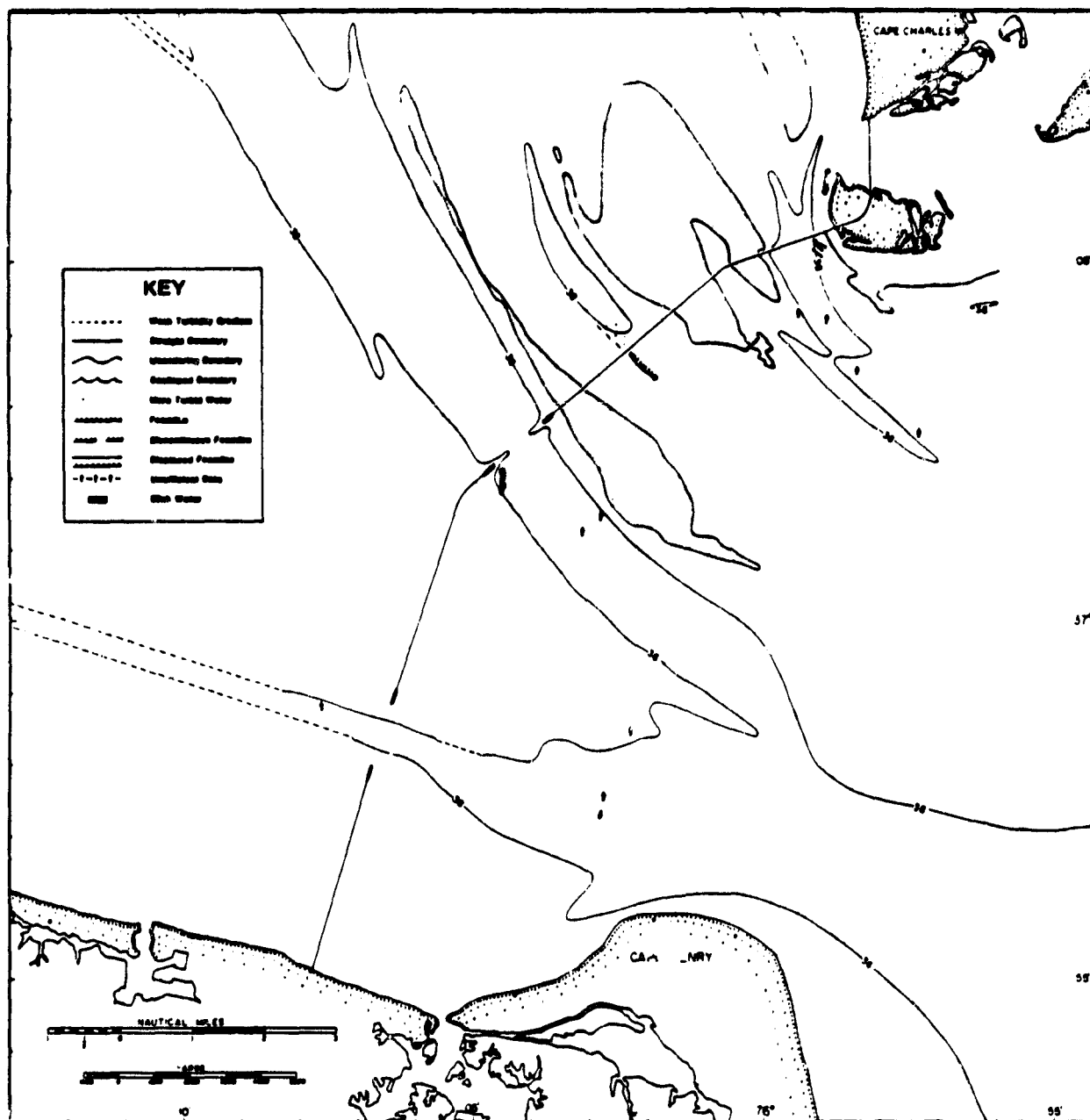
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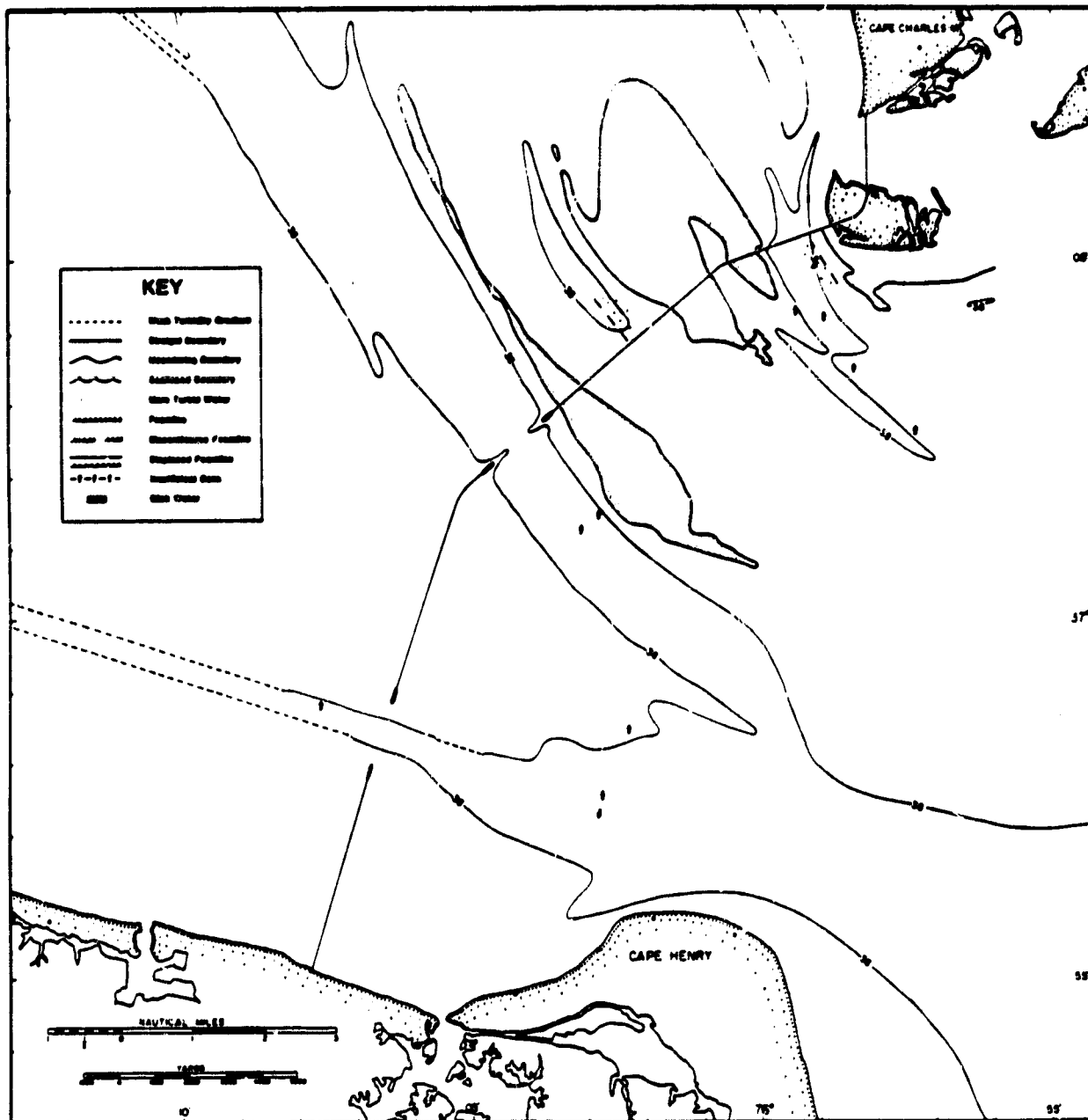
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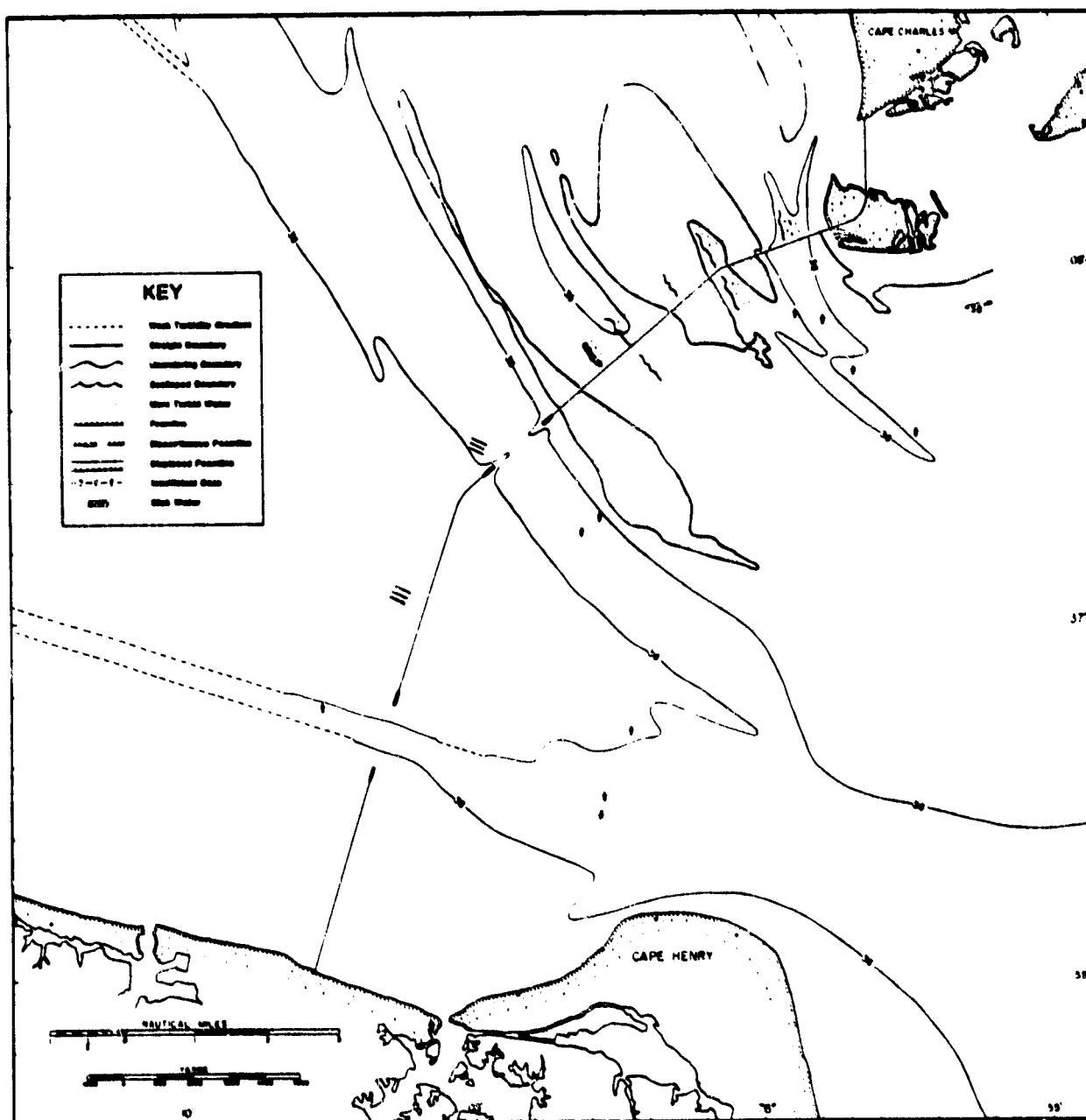
TIME 3 hrs before MLW



DATE 10-8-80

TIME 1 hr before MLW

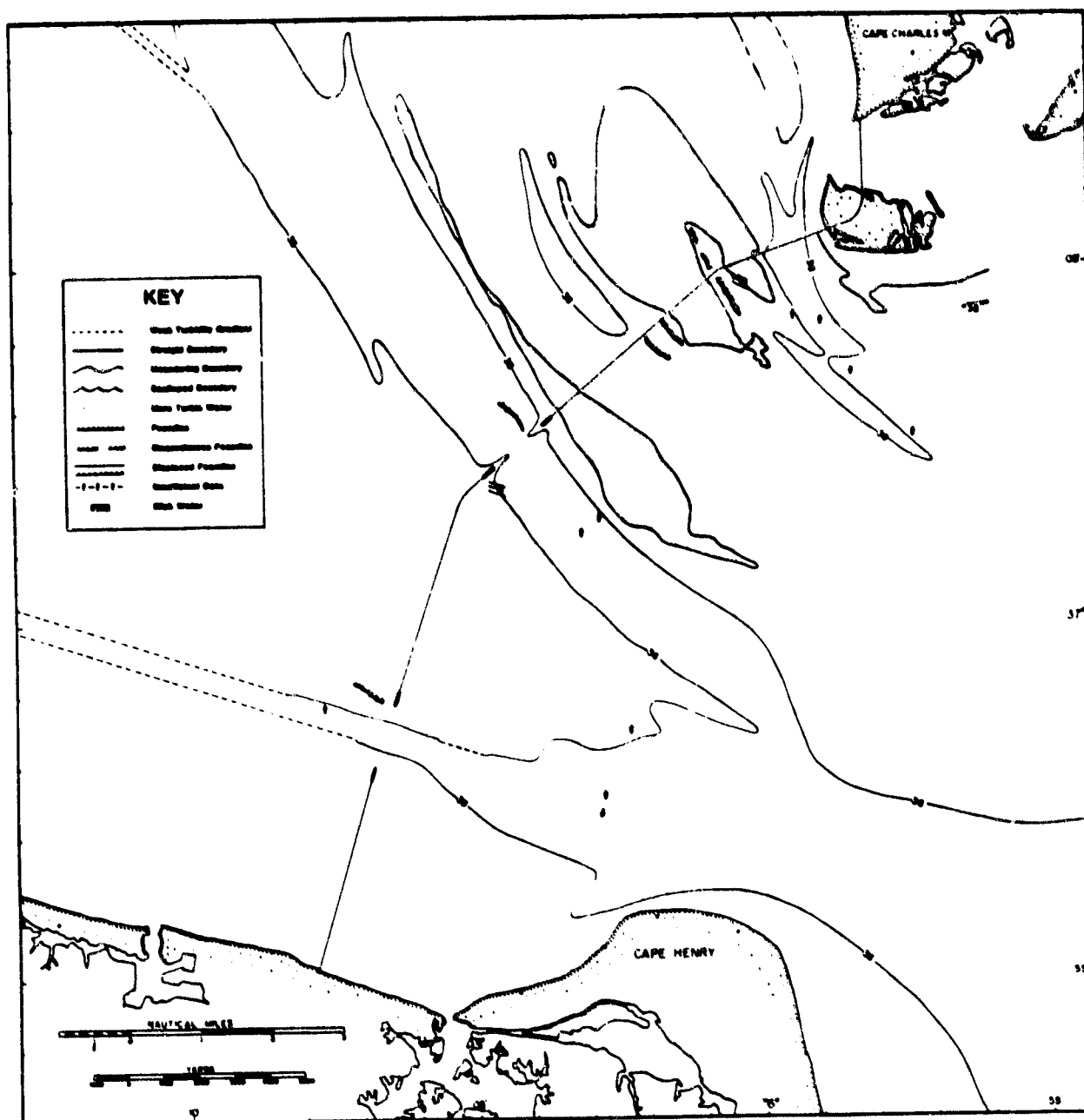
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DATE 10-9-80

TIME 2 hrs before MLW

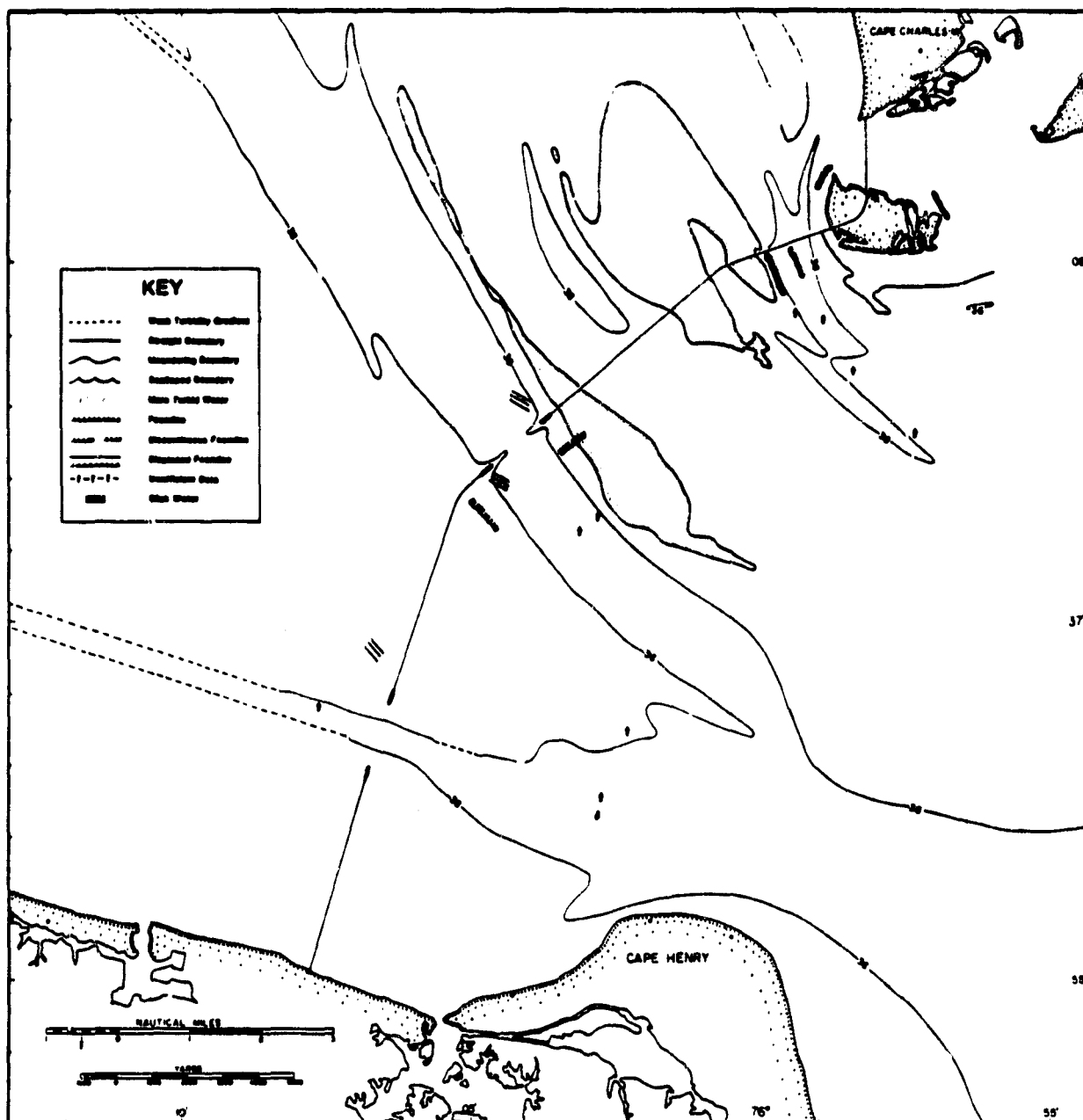


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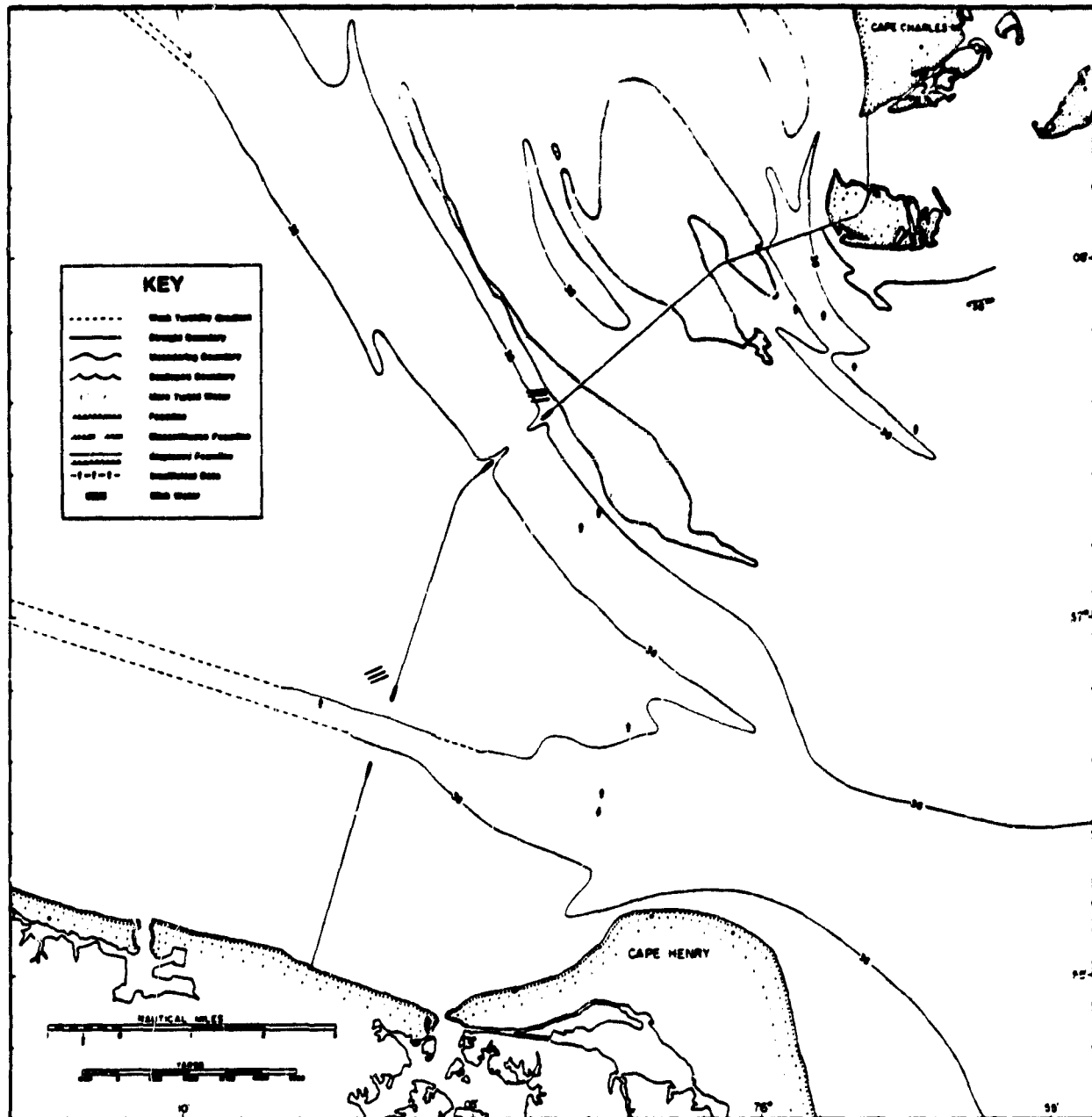
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DATE 10-10-80

TIME 2 hrs before MLW



APPENDIX C

MAPS SHOWING SURFACE CHARACTERISTICS
AND WRITTEN OBSERVATIONS FROM
FLIGHT TRANSECTS

This appendix contains written observations of flight transects based on all available data as well as maps of surface roughness observations made during 24 selected passes of the Wallops P-3 aircraft.

10/07/80

TIME (TV)	TIME (35 mm)	DESCRIPTION	COMMENTS
15:14:50		Start record	Pass No. 2-1S
15:16:50		IP (Light Tower)	L-Band time: -1 s
15:18:03		Beach	SUSS time: OK
15:18:12		Boat wake	AOL time: OK TV time
15:18:14		Front w/scalloped foam line Turbidity boundary Turbid to the North Trend 90°	Heading: 233° Wind: 328°; 1.01 m/s (2 kn) A/C speed: 108 m/s (210 kn)
15:18:22		Small boat	Ground speed: 107 m/s
15:18:25		Foam line, trend 90°	Temp: 14° C
15:18:25		Front with scalloped foam line Turbidity boundary	Side-looking TV count: 332
15:18:52		Horns pointing to the South Trend 75°	
15:19:04		Turbidity change More turbid to the North	
	15:19:08	Front with patch foam line Strong turbidity boundary Horns pointing to the West Turbid to the East Trend 170°	

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10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-1S (Concluded)
15:19:12	15:19:09-11	Front w/strong foam Turbid to East Trend 110° - turns to 180°	
15:19:19		Striations	
15:19:29	15:19:26-30	Front w/strong foam line Scalloped - horns pointing to the West Slightly more turbid to the East? Trend 45°	
15:19:45		Striations	
15:19:59		Turbidity change Turbid to the North	
15:20:20	15:20:19	Bay Bridge	
15:20:59		Turbidity change	
15:21:02		Turbidity change	
15:21:10		Turbidity change	
15:21:17		Turbidity change	
15:21:23		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:24:20		Start record	Pass No. 4-1N
15:26:21		IP	L-Band time: OK TV
15:27:19		Data on	SUSS time: OK TV
15:27:30		Ship--dead center	AOL time: OK TV
15:27:39		Ship on right	ΔK: 2 s slow
15:27:51		Striation	Heading: 232°
15:28:15		Front w/strong foam line Scalloped - horns pointing to the Southwest Turbidity boundary Turbid to the Northeast Trend 140°	Wind: 220°; 1.01 m/s (2 kn) A/C speed: 108 m/s (210 kn) Ground speed: 107 m/s
15:29:09		Weak turbidity change Turbid to the North	Temp: 14° C Side-looking TV count: 510
15:29:21		Menhaden boat trail	
15:29:32		Beach	
15:29:38		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:35:17		Start record	Pass No. 1-1S
15:36:28		IP	L-Band time: OK (± 0.5 s)
15:36:47		Data on (beach)	AOL time: OK TV time
15:37:05	15:37:05-7	Patchy foam line Clear H ₂ O just on edge of foam line	Heading: 233° Wind: 265°; 1.03 m/s (2 kn)
15:37:54		Front w/strong foam line Horns pointing to the Southwest Turbid to the Northeast Trend 160°	A/C speed: 102.9 m/s (200 kn) Ground speed: 102 m/s Temp: 14° C
	15:38:36	Striation	Side-looking TV count: 704
15:39:44	15:39:46-49	Meandering turbidity change More turbid to the Southwest	
15:40:30		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:45:30		Start record	Pass No. 2-2N
15:45:37		IP (beach)	L-Band time: OK TV
15:46:24		Data on	AOL time: OK TV time
15:46:40-46		Small boats	Heading: 050°
15:46:47		Turbidity boundary Turbid to the Northwest Trend 45°	Wind: 228°; 2.6 m/s (5 kn) A/C speed: 108 m/s (210 kn)
15:46:53		Channel marker (R-10)	Ground speed: 107 m/s
15:47:20		Bridge Tunnel	Temp: 14° C
15:47:31		Boat wake	Side-looking TV count: 853
15:47:51		Front w/slight foam displaced Off turbidity boundary More turbid to the North Trend 110°	
15:48:20	15:48:17-22	Front w/strong foam line Scalloped--horns pointing to the West Turbid to the East	
15:48:44		Turbidity boundary Turbid to the East Trend 45° then 135°	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-2N (Concluded)
15:48:50	15:48:48-52	Turbidity boundary Trend 180°	
	15:48:52	Small boat in view	
15:48:57		Front up foam line Slightly more turbid to the North Trend 80°	
	15:49:20	Turbidity change Slightly more turbid to the North	
15:49:35		Boat wake	
15:49:35		Boat wake? Foam line?	
15:49:49		Beach	
15:49:53		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:54:40		Start record	Pass No. 3-1S
15:54:52		IP	L-Band time: OK TV
15:55:51		Data on	SUSS time: OK TV
15:55:53		Foam patch from Menhaden boats	AOL time: OK TV
15:56:09-11-12		Foam patch from Menhaden boats	Heading: 222°
15:56:19-24		Menhaden purse seine up boats	Wind: 220°; 1 m/s (2 kn)
15:57:08		Front w/strong foam line Slightly scalloped Horns pointed to the South Turbidity boundary More turbid to the North Trend 120°	A/C speed: 107 m/s (208 kn) Ground speed: 105 m/s Temp: 14° C Side-looking TV count: 1008
15:57:30-32		Striations perpendicular to slight line	
15:58:02		Ship	
15:58:26		Data off	
15:59:37		Beach	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:02:30		Start record	Pass No. 4-2N
16:03:24		IP (Beach)	L-Band time: 1 s fast
16:04:16		Data on	SUSS time: OK TV time
16:04:32		Ship	AOL time: OK TV time
16:04:40		Ship	Heading: 023°
16:04:52		Ship Wake	Wind: 220°; 1 m/s (2 kn)
16:04:56		Turbidity change	A/C speed: 109 m/s (212 kn)
16:04:59		Striations	Ground speed: 109 m/s
16:05:07-08		Striations	Temp: 14° C
16:05:24		Front w/strong foam line Turbidity boundary Horns pointing to the Southwest Turbid to the North Trend 135°	Side-looking TV count: 1118
16:06:06		Ship wake	
16:06:11		Small boat	
16:06:14-15		Ship wake	
16:06:17		Turbid patch and striation	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 4-2N (Concluded)
16:06:24		Front w/discontinuous foam line Turbidity boundary Horns pointing to the South Turbid to the South	
16:06:32		Beach	
16:06:35		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:11:00		Start record	Pass No. 5-1S
16:12:27		IP	L-Band time: OK TV
16:13:21		Beach	SUSS time: OK TV
16:13:30		Data on	AOL time: OK TV
16:13:46		Waves	Swept frequency: 2 s fast
16:13:49-53		Menhaden boat wake	Heading: 196°
16:13:58-14:40		Turbid patches	Wind: 320°; 1.5 m/s (3 kn)
16:14:42-45		Front w/strong foam line Scalloped, horns pointing to the Southwest Turbid to the Northeast Trend 170°	A/C speed: 110.6 m/s (215 kn) Ground speed: 109 m/s Temp: 15° C
16:15:10		Front? (not visible on TV or mm)	Side-looking TV count: 1252
16:15:52		Slick-like formation? Glint?	
16:16:03		Beach - data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:18:00		Start record	Pass No. 6-1N
16:19:03		IP (Beach)	AOL time: OK
16:19:04		Data on	120 s in pass- altitude changed
16:19:08-13		Striations	Heading: 029°
16:19:14		Turbidity change More turbid to the South	Wind: 320°; 1.5 m/s (3 kn)
16:19:49-50		Weak foam line	A/C speed: 110.6 m/s (215 kn)
16:20:35-55		Turbid patches	Ground speed: 106 m/s
16:21:11-52		Turbid patches	Temp: 15° C
16:22:01		Weak foam line Horns pointing to the Southeast? Turbid to the Northwest Trend 60°	Side-looking TV count: 1325
16:22:10-22		Breakers	
16:22:34		Beach	
16:22:32-34		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:27:00		Start record	Pass No. 6-1N
16:27:26		IP (Lighthouse)	Heading: 231°
16:28:35	no 35 mm coverage	Beach	Wind: 320°; 1 m/s (2 kn)
16:28:46		Boat	A/C speed: 110.6 m/s (215 kn)
16:29:13		Front w/strong foam line Horns pointing to the Southeast Turbid to the Northwest	Ground speed: 108 m/s Temp: 15° C
16:30:09		Front w/foam line Turbid to the East Trend 180°	Side-looking TV count: 1442
16:30:02		Boat wake	
16:30:37	16:30:40	Bay Bridge	
16:31:10		Data off	
16:31:22		Turbidity change More turbid to the North	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:35:20		Start record	Pass No. 4-3N
16:36:57		IP (Beach)	AOL time: OK TV time
16:38:00		Data on	Heading: 025°
16:38:07		Channel buoy	Wind: 220°; 2.6 m/s (5 kn)
16:38:26		Ship	A/C speed: 110.6 m/s (215 kn)
16:38:34-46		Striation	Ground speed: 106 m/s
16:38:58		Front w/strong foam line Turbidity boundary Horns pointing to the Northwest More turbid to the Southeast Trend 45°	Temp: 15° C Side-looking TV count: 1540
16:39:16		Turbidity change	
16:39:35-37		Front w/strong foam line scalloped slightly Turbidity boundary Horns pointing to the Southwest Turbid to the Northeast	
16:39:38		Turbid patch	
16:39:42-44		Turbid patches	
16:39:52		Turbidity changes	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 4-3N (Concluded)
16:40:10-11		Boat wake	
16:40:12		Data off	
16:40:13		Beach	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:44:45		Start record	Pass No. 2-4S
16:45:53		IP (Lighthouse 1000 ft to right)	L-Band time: + 2 s
16:46:56		Data on (beach)	SUSS time: TV OK
16:47:01-10		Discoloration in water	AOL time: TV OK
	16:47:03	Boat wake	Heading: 232°
	16:47:07	Turbid band	Wind: 320°; 1.5 m/s (3 kn)
	16:47:16	Patchy turbid areas	A/C speed: 108 m/s (215 kn)
	16:47:19	Turbid patch	Ground speed: 108 m/s
	16:47:21	Weak boundary turbid to North	Temp: 16° C
	16:47:25	Patchy	Side-looking TV count: 1642
16:47:30	16:47:31-33	Front with foam--irregular boundary Turbid to the Northeast	
	16:47:52	Striation	
16:48:05-07		Weak front	
16:48:15-28		Turbid to the Southwest Edge of front with foam in view	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No 2-4S (Concluded)
	16:48:28	Foam from boat?	
	16 48:30	Irregular foam - boat wake?	
16:49:09		Bay Bridge Tunnel	
16:49:43-46		Boat wake through front turbid to the Southwest scalloped, horns pointing to Southwest No foam	
16:49:44		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:55:54		Start record	Pass No. 4-4N
16:55:39		IP (Beach Tower)	L-Band time: 3 s fast
16:56:40		Data on	SUSS time: OK TV time
16:56:52		Channel marker	AOL time: OK TV time
16:57:09	16:57:11	Ship	Heading: 025°
16:57:28	16:57:30	Striation More turbid to the North	Wind: 320°; 1 m/s (2 kn)
16:57:38	16:57:40	Front w/irregular foam line Turbidity boundary More turbid to the South Trend 85°	A/C speed: 108 m/s (210 kn) Ground speed: 100 m/s Temp: 16° C
16:58:04		Striation at boundary of color change	Side-looking TV count: 1746 end tape
16:58:29	16:58:32	Front w/strong foam line Scallops, horns pointing to the South Turbid to the North Trend 90° (Boat?) Which one?	
16:58:55		Ship wake	
16:58:57		Menhaden boat wake	
16:59:05		Surf	
16:59:07		Data off (beach)	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:05:30		Start record	Pass No. 2-5S
17:05:59		IP	L-Band time: - 3 s fast
17:07:13		Beach	SUSS time: OK TV time
17:07:30		Data on	AOL time: OK TV time
17:07:33	17:07:36	Front with slight foam line Turbid to the Northeast Trend 135°	Heading: 230° Wind: 220°; 2.1 m/s (4 kn)
17:07:39	17:07:41-42	Weak foam line Turbid to the South Trend 50° (Holton)	A/C speed: 108 m/s (210 kn) Ground speed: 98 m/s Temp. 16° C
17:07:52	17:07:54-55	Front with irregular foam line Displaced to the Northwest Off turbidity boundary	Side-looking TV count: 165
	17:07:55(Waves)	Horns to the South Small scallops Turbid to the Northwest	
17:08:27		Striations	
	17:08:36	Striations	
	17:08:47	Striations	
	17:08:50	Bifurcating Striations	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:09:44	17:09:47	Bay Bridge Tunnel	Pass No. 2-5S (Concluded)
17:10:15	17:10:18	Slight foam line Turbid to the Southwest	
17:10:18	17:10:20	Front w/buoy (R-10?) Slight foam line	
17:10:33	17:10:36	Boat wake	
17:10:36		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:14:10		Start record	Pass No. 4-5N
17:16:15		IP (beach)	SUSS time: 1 s fast
17:16:39		Ship	AOL time: OK TV time
	15:16:42	Striations	SP time: 3 s fast
17:17:00		Data on	Wind: 220°; 3.1 m/s (6 kn)
17:17:11		Channel marker (red)	A/C speed: 108 m/s (210 kn)
17:17:36	17:17:37	Turbidity change More turbid to the SE	Ground speed: 104 m/s
17:17:43	17:17:46	Turbidity change More turbid to the South Trend 80°	Temp: 16° C
17:17:47	17:17:52	Ship	Side-looking TV count: 379
17:17:13	End 35 mm coverage	Weak foam line? Turbidity change More turbid to the North	
17:19:05		Front w/strong foam line Scallops, horns pointing South Turbid to the North	
17:19:27		Foam line, turbidity change	
17:19:39		Data off (beach)	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:25:00		Start record	Pass No. 2-6S
17:25:35		IP	L-Band time: 4 s fast
17:26:43		Beach	SUSS time: 1 s time
17:26:56		Data on	AOL time: OK TV time
17:26:57	13:26:57	Front w/foam line Turbidity boundary Turbid to the North Trend 110°	Note: failure to mark data on may make this a poorly documented pass
17:27:11		Front with foam line Slightly more turbid to the North Trend 90°	Heading: 230° Wind: 030°; 1.5 m/s (210 kn)
17:27:21		Boat	A/C speed: 108 m/s (210 kn)
17:27:25		Weak More turbid to the North Trend 45°	Ground speed: 105 m/s Temp: 16° C
17:28:10		Weak turbidity change	Side-looking TV count: 590
	13:28:14	Striations	
	13:28:21	Striations	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-6S (Concluded)
17:29:05	13:29:09	Bay Bridge	
17:29:26	13:29:30	Turbidity change Turbid to the Southeast Trend 135°	
17:29:45		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:32:00		Start record	Pass No. 4-6N
17:35:51		IP (beach)	SUSS time: 1 s fast
17:37:21		Data on	SF time: 5 s time
17:37:45	13:37:49	Front w/foam line, small scallops within large scallops, horns pointing to the North More turbid to the South Trend 80°	Heading: 025° Wind: 060°; 1 m/s (2 kn) A/C speed: 108 m/s (210 kn) Ground speed: 103 m/s
17:38:19	13:38:19	Slight turbidity change More turbid to the South	Temp: 16° C
17:38:40	13:38:44	Front w/strong foam line Turbidity boundary Scallops, horns pointing South Turbid to the North Trend 90°, (Boat?)	Side-looking TV count: 752
17:38:41-46	13:38:46	Continuation of above Turbid to the South (<u>Osprey</u>)	
	13:38:47	Curved front w/foam line Turbidity boundary, horns pointing into the clear H ₂ O--N horns pointing into the turbid South, turbid to the East	
17:38:48	13:38:52	Turbidity change (<u>ODU-1</u>)	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 4-6N (Concluded)
17:38:51-52	13:38:54	Boat wake	
17:38:54	13:38:59	Marker buoy and striations from Bridge Tunnel	
17:38:57	13:39:04	Front w/strong foam line--no turbidity difference; mottled surface, scalloped horns pointing both ways, larger horns point to the Northeast	
17:39:03	13:39:08-10	Front w/foam line Turbidity boundary Scalloped, Horns point to the Southwest More turbid to the NE Varying wave approach	
	13:39:11	Turbidity change	
17:39:11	13:39:16	Beach	
17:39:15		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:43:40		Start record	Pass No. 2-7S
17:44:35		IP (Light Tower)	SUSS time: 1 s fast
17:45:47		Beach	AOL time: OK TV time
17:45:49		Data on	SF time: 5 s time
17:45:52	13:45:57-58	Front w/irregular foam line Turbid to the North Trend 110°	Heading: 232° Wind: 040°; 2.1 m/s (4 kn)
	13:46:13	Buoy	A/C speed: 108 m/s (210 kn)
17:46:14	13:46:18	Scalloped foam line Turbid to the North Trend 90°	Ground speed: 105 m/s Temp: 16° C
17:46:19	13:46:24	No foam-turbidity change? Turbid to the South Trend 90°	Side-looking TV count: 910
17:46:29	13:46:32	Turbidity change Turbid to the Northwest Trend 45°	
17:47:11	13:47:16	Slight foam line Turbid to the North Trend 75°	
17:47:19	13:47:24	Boat wake	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-7S (Concluded)
17:48:04	13:48:09	Bay Bridge Tunnel	
	13:48:27	Turbidity Change Turbid to the North	
17:48:41		Data off	

10/07/80 (Continued)

TIME (TV)	TIME (35 mm)	DESCRIPTION	COMMENTS
17:54:30	13:56:56	Start record	Pass No. 4-7N
17:55:17		IP (beach)	L-Band time: 6 s fast
17:56:48		Data on	SUSS time: 1 s fast
17:57:02	13:57:08-10	Weak foam line Turbid to the Southwest Trend 45°	AOL time: OK TV time Heating: 022°
	13:57:11	Slick in Southeast corner? Glint?	Wind: 220°; 2.6 m/s (5 kn)
	13:57:40	Striations	A/C speed: 108 m/s (210 kn)
17:58:07	13:58:13	Boat wakes	Ground speed: 102 m/s
17:58:11	13:58:16-17	Weak foam line Turbid to the Northeast (Holton)	Temp: 16° C
17:58:23		Turbidity change?	Side-looking TV count: 1050
	13:58:26	Red buoy	
17:58:29	13:58:34-35	Boat wake?	
17:58:36	13:58:38	Patchy foam Turbid to the Northeast Approaching beach	
17:58:40	13:58:44	Beach	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:02:30		Start record	Pass No. 2-8S
18:04:16		IP	SUSS time: 2 s fast
18:05:28		Data on	AOL time: OK TV time
18:05:32	18:05:37	Beach	SF time: 6 s fast
18:05:37	18:05:43	Front with weak foam Turbid boundary-turbid to N Trend 75°	Heading: 230° Wind: 250°; 1 m/s (2 kn)
18:05:57	18:06:02	Front turbidity boundary Turbid to the North Trend 90° (Holton)	A/C speed: 108 m/s (210 kn) Ground speed: 100 m/s
18:06:14	18:06:20	Turbidity change-striation?	Temp: 16° C
18:06:41	18:06:46	Weak foam line Slight turbidity change Turbid to the Southeast Trend 70°	Side-looking TV count: 1190
18:06:59	18:07:01	Turbidity change Turbid to the East Trend 170°	
	18:07:05	Front turbidity boundary No foam Undulating boundary Turbid to the North Trend 80°	
18:07:05		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:13:30		Start record	Pass No. 4-8N
18:15:06		IP (beach)	SUSS time: 1 s fast
18:16:28		Data on	AOL time: OK TV time
18:16:39		Ship	SF time: 6 s fast
18:16:57		Front w/foam line?	Heading: 023°
	18:16:48	Turbid patches and numerous striations	Wind: 160°; 2.6 m/s (5 kn)
18:17:03		Turbidity change?	A/C speed: 108 m/s (210 kn)
18:17:55	18:18:01	Striation Turbidity change Trend 90°	Temp: 16° C
18:17:58	18:18:04	Turbidity change Three color change	Side-looking TV count: 1313
18:18:07	18:18:13	Turbidity change Foam More turbid to the North Trend 135° Boat wake?	
18:18:36	18:18:42	Beach	
18:18:37		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:23:00		Start record	Pass No. 2-95
18:23:39		IP	SUSS time: 1 s fast
18:24:46		Data on	AOL time: OK TV time
18:24:50	18:24:55	Beach	SP time: 5 s fast
18:24:56	18:25:01-06	Boat wake? Weak turbidity change Trend 90°	Heading: 229° Wind: 150°; 3.1 m/s (6 kn)
18:25:16	18:25:21-22	Front w/weak foam line Turbidity boundary Turbid to the North Trend 90° (<u>Holton</u>)	A/C speed: 108 m/s (210 kn) Ground speed: 102 m/s Temp: 16° C
18:25:24	18:25:30	Front turbidity boundary Turbid to the South Trend 80°	Side-looking TV count: 1439
18:25:27	18:25:33	Front turbidity boundary Turbid to the East Trend 180°	
18:26:00	18:26:06	Front with light foam No turbidity boundary distinguishable Triangular shape	
18:26:16	18:26:22	Front w/weak foam line Turbid to the North Trend 85° (<u>Osprey</u> or <u>000-1</u>)	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:27:09	18:27:15	Bay Bridge	Pass No. 2-9S (Concluded)
18:28:15		Data off	

10, 07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:33:00		Start record	Pass No. 4-9N
18:33:59		IP (beach)	SUSS time: 1 s fast
18:35:28		Data on	AOL time: OK TV time
18:35:33	18:35:39	Large ship to part of screen	SF time: 7 s fast
18:35:54	18:36:01	Front w/weak foam line Turbidity boundary Turbid to the North Trend 110°	Heading: 023° A/C speed: 108 m/s (210 kn)
	18:36:21	Striations Trend 120°	Ground speed: 102 m/s Temp: 96° C
18:36:24	18:36:31	Front strong turbidity boundary Turbid to the Southeast Trend 50°	Side-looking TV count: 1537
18:36:49	18:36:57	Front weak turbidity boundary Turbid to the Southwest Trend 120° (Trawler)	
18:37:00	18:37:06	Front w/undulating foam line Weak turbidity boundary Turbid to the Northeast Trend 120° (<u>ODU-1</u>)	
18:37:26		Data off (beach)	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:41:15		Start record	Pass No. 2-10S
18:42:05		IP (Lighthouse)	SUSS time: 1 s fast
18:43:13		Data on	AOL time: OK TV time
18:43:17	18:43:24	Beach	SF time: 7 s fast
18:43:47	18:43:54	Front w/light foam Turbidity boundary Turbid to the North Trend 90° (Osprey w/cards)	Heading: 227° Wind: 190°; 3.1 m/s (6 kn) A/C speed: 108 m/s (210 kn)
18:43:56-58	18:44:06	Turbidity change Turbid to East Irregular trend	Ground speed: 98 m/s Temp: 16° C
18:44:52	18:44:58-59	Front w/weak foam displaced to the South of the turbidity boundary Horns pointing to the South Turbid to the North Trend 90°	Side-looking TV count: 1639
18:45:49	18:45:57	Bridge Tunnel	
18:46:05		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:50:45		Start record	Pass No. 4-10N
18:52:26		IP (beach)	L-Band time: 8 s fast
18:53:48		Data on	SUSS time: 1 s fast
18:54:20	18:54:28	Front w/semi-developed foam line-turbidity boundary Horns pointing to the North Turbid to the North Trend 120°	AOL time: OK TV time Heading: 027° Wind: 150; 3.1 m/s (6 kn)
	18:54:46	Striations	A/C speed: 100.3 m/s (195 kn)
18:54:40	18:54:48	Front w/foam line displaced to the North of turbidity boundary Horns pointing to the North Turbid to the South turbidity Trend 70°	Ground speed: 101.5 m/s Temp: 15° C Side-looking TV count: 1737
18:55:03	(Not observed)	Weak front with foam line	
18:55:15	18:55:23	Front w/weak foam line displaced to the North of turbidity boundary Slightly more turbid to South Trend 120°	
18:55:23	18:55:31	Boat wake? Weak foam--slight turbidity change Trend 160°	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 4-10N (Concluded)
18:55:32	18:55:40-41	Channel marker (red)	
18:55:51	18:55:59	Beach	
18:55:53		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:00:00		Start record	Pass No. 2-11S
19:00:18		IP	L-Band time: 1 s fast
19:01:23		Data on	AOL time: OK TV time
19:01:28	19:01:34	Beach	SF: 8 s fast
19:01:57	19:02:05-07	Front w/foam turbidity boundary Horns pointing to South Turbid to North Trend 100° (<u>ODU-1</u> on North side)	Heading: 228° Wind: 160°; 3.6 m/s (7 kn) A/C speed: 100.3 m/s (195 kn)
19:02:21	19:02:29	Front w/strong foam line Turbidity boundary Small horns pointing to SE Turbid to the Northwest Trend 70°	Ground speed: 102 m/s Temp: 15° C
19:02:59	19:03:07	Strong front w/foam line Displaced to the South of the turbidity boundary Horns pointing to the South Turbid to the North Trend 90°	Side-looking TV count: 1829 end tape
19:04:01	19:04:07	Bridge Tunnel	
19:04:09		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:09:30		Start record	Pass No. 4-11N
19:10:25		IP	SUSS time: 1 s fast
19:11:52		Data on	AOL time: OK TV time
19:12:16	19:12:23-24	Front w/patchy foam Turbidity boundary Horns pointing to the South Turbid to the North Trend 100°	SF: 8 s fast Heading: 027° Wind: 150°; 4.1 m/s (8 kn)
19:12:32	19:12:40	Front w/patchy foam Strong turbidity boundary Turbid to the Southeast Trend 75°	A/C speed: 97.7 m/s (190 kn) Ground speed: 100 m/s Temp: 15° C
19:13:09	19:13:17	Front w/pronounced foam line Weak turbidity boundary Horns pointing to the North Turbid to the South Trend 100°	Side-looking TV count: 000 start tape 3
19:13:14	19:13:22	Front w/foam line Turbidity boundary Horns pointing to the NE Turbid to the Southwest	
19:13:48	19:13:56	Beach	
19:13:49		Data off	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:18:00		Start record	Pass No. 2-12S
19:18:40		IP	L-Band time: 9 s fast
19:19:37		Data on	SUSS time: 2 s fast
19:19:45	19:19:53	Beach	AOL time: OK TV time
19:19:47	(Not observed)	Shore front/oil--not clearly defined in film	Heading: 229°
19:20:09	19:20:18	Channel buoy (white)	Wind: 145°; 3.1 m/s (6 kn)
19:20:14	19:20:23	Front w/strong foam line Slight no turbidity boundary Trend 100°	A/C speed: 100.3 m/s (195 kn)
19:20:39	19:20:47-48	Front w/strong, undulating foam line Turbidity boundary Turbid to the Northwest Trend 70°	Ground speed: 97 m/s
19:21:18	19:21:27	Front (<u>Holton</u>) (<u>Osprey</u>) (<u>ODU-1</u>)	Temp: 15° C
19:21:33	19:21:42	Front w/patchy foam line No turbidity change visible Horns pointing to the North Trend 100°	Side-looking TV Count: 197
19:22:03		Data cff	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:31:00		Start record	Pass No. 4-12N
19:31:31		IP (beach)	L-Band time: 9 s fast
19:32:56		Data on	SUSS time: 2 s fast
19:33:14	19:33:23	Front w/weak foam line breaking up Slightly more turbid to the N Trend 90°	AOL time: OK TV time Heading: 025°
19:33:17	19:33:25-26	Front w/strong foam line (rippled) Turbidity boundary Turbid to the North Trend 90°	Wind: 160°; 4.6 m/s (9 kn) A/C speed: 100.3 m/s (195 kn) Ground speed: 104 m/s
19:33:25	19:33:34	Turbidity change Turbid to the South Trend 80°	Temp: 15° C Side-looking TV Count: 462
19:33:41	19:33:49	Striation--trend 150°	
19:33:58	19:34:08	Weak foam line? Slight no turbidity change Trend 90°	
19:34:08	19:34:16-17	Front w/strong foam line Turbidity boundary Turbid to the South Trend 100°	

10/07/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:34:11	19:34:22	Front w/strong foam line Turbidity boundary Horns pointing to the NE? Turbid to the Southwest Trend 135°	Pass No. 4-12N (Concluded)
19:34:32	19:34:41	Buoy (white)	
19:34:47		Data off	
19:34:49	19:34:56	Beach	

10/07/80 (Continued)

<u>TIME</u>	<u>TV</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:39:00		No 35 mm coverage	Start record	Pass No. 2-13S
19:39:38			IP	L-Band time: 10 s
19:40:44			Data on	SUSS time: 2 s fast
19:40:46			Beach	AOL time: OK TV time
19:40:50			Slick (not visible on TV)	Heading: 228°
19:40:57			Front (not visible on TV) Front w/slight foam Turbidity boundary Turbid to the South Trend 110°	Wind: 140°; 4.1 m/s (8 kn) A/C speed: 101.9 m/s (198 kn) Ground speed: 98.5 m/s
19:41:29			Weak foam line Trend 90°	Temp: 15° C
19:41:43			Weak foam line Trend 50° (No turbidity change visible)	Side-looking TV Count: 642
19:42:20			Front (not visible on TV)	
19:42:35			Front w/slight foam Horns pointing to the North Trend 90°	
19:43:18			Bay Bridge	
19:43:26			Data off	
19:45:16			Beach	

10/07/80 (Concluded)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:49:00	No 35 mm coverage	Start record	Pass No. 4-13N
19:49:53		IP	L-Band time: 10 s fast
19:50:12		Ships	SUSS time: 2 s fast
19:51:14		Data on	AOL time: OK TV time
19:51:22		Ship	Heading: 027°
19:51:42-45		Front w/weak foam line	Wind: 150°; 4.1 m/s (8 kn)
19:52:29		Front (not visible on TV)	A/C speed: 161.9 m/s (198 kn)
19:52:34		Front w/foam line Horns pointing South Turbid to the North Trend 110°	Ground speed: 103 m/s Temp: 15° C Side-looking TV Count: 799
19:53:12		Turbidity boundary Turbid to the South Trend 140°	
19:53:15		Beach	
19:53:17		Data off	

10/08/80

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:27:10		IP	Pass No. 2-15
15:28:18		Data on	L-Band time: OK
15:28:23	11:28:22	Beach	SUSS time: OK
15:28:35	19:28:34	Turbidity change More turbid to the SE Trend 45°	AOL time: OK Heading: 233°
15:29:04	11:29:03-04	Turbidity change Turbid to the NW Trend 60°	Wind: 258°; 8.7 m/s (17 kn) A/C speed: 102.9 m/s (200 kn)
	19:29:17	Turbid patch	Ground speed: 97 m/s
15:29:22		Turbidity change Trend 55°	Temp: 19° C
15:29:41		Front, strong turbidity boundary More turbid to the East Trend 150°	Side-looking TV count: 45
15:29:50		Small boat of wake	
15:29:52		Small boat	
15:29:56	(not visible)	Possible weak front	
15:30:57		Bride Tunnel	
15:31:11		Data off	

(Continued)

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:36:00		Start record	Pass No. 3-IN
15:36:32		IP (beach)	L-Band time: OK TV time
15:38:12		Data on	SUSS time: OK TV time
15:38:41	11:38:40-41	Weak turbidity change More turbid to the North Trend 100°	AOL time: OK TV Time Heading: 042°
15:39:35	11:39:34	Channel buoy	Wind: 210°; 9.8 m/s (19 kn)
15:40:04	11:40:04	Turbidity change More turbid to the West Trend 30°	Ground speed: 113 m/s Temp: 19° C
15:40:12		Surf	Side-looking TV count: 263
15:40:13		Data off	Can see helo and sample boats in Chesapeake Channel to left of A/C

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:46:13		IP	Pass No. 2-25
15:47:19		Data on	L-Band time: OK
15:47:23	11:47:22	Beach	SUSS time: OK
15:48:05	15:48:05	Front, weak turbidity boundary More turbid to North Trend 80°	AOL time: OK Heading: 233° Wind: 250°; 9.3 m/s (18 kn)
15:48:44	15:48:44	Front, turbidity boundary More turbid to the East Trend 160°	A/C speed: 102.9 m/s (200 kn) Ground speed: 95 m/s
15:48:57	15:48:57	Osprey of drifter cards	Temp: 19°C
15:48:58	15:48:58	Front, weak turbidity boundary More turbid to the North Trend 140°	Side-looking TV count: 504
15:50:09	11:50:09	Bridge Tunnel	
15:50:23		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
15:54:38		Start record	Pass No. 3-2N
15:55:19		IP (Beach)	L-Band time: OK TV
15:56:50		Data on	SUSS time: OK TV
15:57:29	15:57:30	Front, strong turbidity boundary More turbid to North Trend 100° (Shear?) Ship to port, out of view	AOL time: OK TV Heading: 042° Wind: 250°; 9.3 m/s (18 kn)
15:58:58		Data off	A/C speed: 102.9 m/s (200 kn) Ground speed: 112 m/s Temp: 19° C Side-looking TV count: 653

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:04:32		Start record	Pass No. 2-35
16:04:38		IP	L-Band time: OK TV
16:05:51		Data on	SUSS time: OK TV
16:05:58	12:05:59	Shoreline	AOL time: OK TV
	12:06:04	Turbidity change More turbid to the South Trend 80° (boat trail?)	Heading: 234° Wind: 255°; 9.8 m/s (19 kn)
	12:06:09	Lark patch?	A/C speed: 102.9 m/s (200 kn)
16:06:38		Front, turbidity boundary Horns pointing to the South More turbid to the North Trend 60°	Ground speed: 93 m/s Temp: 19° C Side-looking TV count: 837
16:06:50	12:06:53	Strong front with foam displaced to the West of the turbidity boundary More turbid to the East Trend 180°	
16:06:57	(not visible)	Front off to the side	
16:07:02	12:07:02	Front, turbidity boundary More turbid to the Northeast Trend 135°	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-35 (Concluded)
16:07:21		Weak turbidity change	
16:08:30	12:08:32	Bridge Tunnel	
16:08:42		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:13:26		Start record	Pass No. 5-1N
16:15:30		IP (Missed)	L-Band time: 1 s fast
16:16:01		Data on	SUSS time: OK TV time
	12:16:14	Buoy	AOL time: OK TV time
16:16:20		Slick? (not visible)	Heading: 013°
	12:16:48	Weak turbidity change More turbid to the NE Trend 135°	Wind: 210°; 9.3 m/s (18 kn) A/C speed: 102.9 m/s (200 kn)
16:16:52	12:16:53	Front with foam Scallops, horns pointing to the South More turbid to the North	Ground speed: 111 m/s Temp: 19° C Side-looking TV count: 985
16:17:38		Front forming to the left (not visible)	
16:18:12	12:18:12	Shoreline	
16:18:12		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:22:34		Start record	Pass No. 2-45
16:23:35		IP (off to left)	L-Band time: 2 s fast
16:24:42		Data on	SUSS time: OK TV time
16:24:47		Shoreline	AOL time: OK TV time
16:24:53		Weak turbidity change More turbid to the South Trend 50°	Heading: 233° Wind: 250°; 7.2 m/s (14 kn)
16:25:15		Weak turbidity change (not visible)	A/C speed: 101.9 m/s (198 kn) Ground speed: 94 m/s
16:25:26	12:25:26-27	Front, weak turbidity boundary More turbid to the North	Temp: 19° C Side-looking TV count: 1119
16:25:32	12:25:33	Front, well-developed foam line, turbidity boundary Scalloped, horns pointing to the South More turbid to the North Trend 120°	
16:26:08	16:26:08	Weak front? (not visible)	
16:27:21	12:27:22	Bridge Tunnel	
16:27:34		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:31:54		Start record	Pass No. 3-3N
16:32:20		IP (Beach)	L-Band time: 2 s fast
16:34:11		Data on	SUSS time: OK TV time
16:34:22		Ship wake	AOL time: OK TV time
16:34:39		Turbidity change	Heading: 040°
16:34:49	12:34:50	Front, turbidity boundary More turbid to the North Trend 90°	Wind: 210°; 10.3 m/s (20 kn) A/C speed: 101.9 m/s (198 kn)
16:35:14	12:35:14	Striation, boat wake?	Ground speed: 111 m/s
16:35:31		Front? (not visible on TV or 35 mm)	Temp: 19° C
16:35:39	13:35:39	Channel marker	Side-looking TV count: 1224
16:35:42	12:35:43	Striation? boat wake?	
16:36:01		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:42:01		Start record	Pass No. 2-55
16:42:22		IP	L-Band time: 3 s fast
16:43:29		Data on	SUSS time: OK TV time
16:43:37	12:43:39	Beach	AOL time: OK TV time
16:44:02	12:44:03	Front, turbidity boundary More turbid to the South Trend 55°	Pass stopped short of bridge tunnel Aborted due to air traffic
16:44:04	12:44:05-6	Front, turbidity boundary More turbid to the North Trend 100°	Side-looking TV count: 1367
16:44:14	12:44:16-17	Front w/slight foam Irregular turbidity boundary More turbid to the SE Trend 55° (<u>ODU-1</u> and <u>Holton</u>)	
16:44:50		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
16:52:16		Start record	Pass No. 2-65
16:52:58		IP	L-Band time: 3 s fast
16:53:59		Data on	AOL time: OK TV time
16:54:12	16:54:15	Shoreline	Heading: 233°
16:54:25	16:54:27	Front, w/light foam turbidity boundary More turbid to the NE Trend 140°	Wind: 250°; 7.2 m/s (14 kn) A/C speed: 102.9 m/s (200 kn) Ground speed: 96 m/s
	12:54:40	Front, turbidity boundary More turbid to the South Trend 70°	Temp: 19° C
	12:54:42	Front, turbidity boundary More turbid to the North Trend 90°	Side-looking TV count: 1468
16:54:50	18:54:52	Front, strong turbidity boundary More turbid to the NW Trend 45°	
16:56:05		Remnant wave structure from ship wake	
16:56:44	16:56:47	Bridge Tunnel	
16:57:01		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:01:50		Start record	Pass No. 3-4N
17:02:09		IP (Beach)	L-Band time: 3 s fast
17:03:46		Data on	SUSS time: OK TV time
17:03:54	17:03:56	Ship to left	AOL time: OK TV time
17:04:22	17:04:25	Front, w/slight foam Turbidity boundary More turbid to the North Trend 60°	Heading: 043° Wind: 200°; 8.7 m/s (17 kn) A/C speed: 102.9 m/s (200 kn)
17:04:29-42	17:04:31-42	Front, irregular Turbidity boundary Turbidity to the East Trend 180°	Ground speed: 113 m/s Temp: 19° C Side-looking TV count: 1559
	17:04:42-44	Smooths out and dissipates	
17:04:43	17:04:47	Front gone from view	
17:04:52	17:04:55	Turbidity change More turbid to North Trend 90°	
17:05:13	17:05:13	Turbidity change Turbid patches to the North Trend 50°	
17:05:15	17:05:18	Striations	
17:05:24		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:10:11		Start record	Pass No. 2-75
17:12:09		IP (missed to right)	L-Band time: 3 s fast
17:13:12		Data on	SUSS time: 1 s fast
17:13:20	17:13:25	Shoreline	AOL time: OK TV time
17:13:35		Turbidity boundary Roughness difference?	Heading: 231°
	17:13:38	Striations	Wind: 245°; 7.7 m/s (15 kn)
17:13:57		Front? (not visible on TV)	A/C speed: 102.9 m/s (200 kn)
	17:13:58	Turbid band	Temp: 19° C
17:14:05	17:14:07-09	Front, turbidity boundary Turbid to the Northeast Trend 45° (Osprey cards in place)	Side-looking TV count: 1685
17:14:45		Possible weak front? (not visible)	
17:15:11		Front? (not visible)	
17:16:13	17:16:17	Bridge Tunnel	
17:16:27		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:22:00		Start record IP missed	Pass No. 3-5N L-Band time: 3 s fast
17:23:00	13:23:05	Data on Front--weak Turbidity boundary More turbid to the South Trend 60°	SUSS time: OK TV time Heading: 042° Wind: 205°; 10.8 m/s (21 kn)
17:23:10	13:23:10	Menhaden boat	A/C speed: 102.9 m/s (200 kn)
17:23:32	13:23:36	Front, irregular turbidity boundary More turbid to the Northeast Trend 140°	Ground speed: 112 m/s Temp: 19° C
17:23:59	13:24:01-09	Front with foam, several turbidity boundaries	Side-looking TV count: 1763
17:15:11		Turbid to the Northeast Trend 135°	
17:24:18	13:24:21	Front with patchy foam Strong turbidity boundary Horns pointing to the South More turbid to the North Trend 90°	
17:24:20	13:24:23	Channel buoy	
	13:24:27	Turbid patches	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 3-5N (Concluded)
17:24:27	13:24:29-30	Turbidity boundaries Trend 45°	
17:24:37		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:30:12	No 35 mm coverage	Start record	Pass No. 2-85
17:29:55		IP	L-Band time: 4 s fast
17:30:58		Data on	SUSS time: OK TV time
17:31:07		Shoreline	AOL time: OK TV time
17:31:21		Turbidity change (not visible on TV)	Heading: 233°
17:31:52		Front w/foam line (<u>Holton</u>)	Wind: 260°; 6.7 - s (13 kn)
17:31:57		Front (not visible on TV)	Temp: 19° C
17:32:27		Front, turbidity boundary	Side-looking TV count: 000 start tape 2
17:33:49		Bridge Tunnel	
17:34:03		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:39:00		Start record	Pass No. 3-6N
17:39:29		IP (Beach)	L-Band time: 5 s fast
17:41:16		Data on	SUSS time: 1 s fast
17:41:57		Turbidity change	AOL time: OK TV time
	13:42:02-03	Turbidity change (3 bands)	Heading: 043°
			Wind: 205°; 8.7 m/s (17 kn)
17:42:17	13:42:22	Striation	A/C speed: 102.9 m/s (200 kn)
17:42:37	13:42:42	Front with foam Turbidity boundary More turbid to the North Trend 50°	Ground speed: 109 m/s Temp: 1° C
17:42:39	13:42:44	Channel marker	Side-looking TV count: 192
	13:42:46	Turbid patches	
17:42:56		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:48:19		Start record	Pass No. 2-95
17:48:37		IP	L-Band time: 5 s fast
17:49:39		Data on	SUSS time: 1 s fast
17:49:55	17:49:59	Beach	AOL time: OK TV time
17:50:04	17:50:09	Front w/patchy foam Turbidity boundary Turbid to the North Trend 90°	Heading: 231° Wind: 253°; 7.2 m/s (14 kn) A/C speed: 102.9 m/s (200 kn)
17:50:19	17:50:23	Small ship	Ground speed: 94 m/s
17:50:24	13:50:28-29	Front, turbidity boundary Turbid to the Southeast Trend 45°	Temp: 19° C Side-looking TV count: 422 Chesapeake Channel (not visible on TV or 35 mm)
17:50:33	13:50:36-37	Front w/slight foam More turbid to the North Trend 90°	
17:51:28	17:51:32-33	Turbidity change Turbid to the North	
17:52:15	17:52:20	Boat wake	
17:52:19	13:52:23	Boat	
17:52:29	13:52:33	Bridge Tunnel	
17:52:42		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
17:57:00		Start record	Pass No. 3-7N
17:57:53		IP (Beach)	L-Band time: 5 s fast
17:59:37		Data on	SUSS time: 1 s fast
17:59:37	13:59:44	Striations	AOL time: OK TV time
	13:59:55	Striations, glint?	Heading: 042°
18:00:57	18:01:01-02	Front w/slight foam Scalloped, horns pointing to the South Turbid to the North Trend 60°	Wind: 205°; 8.7 m/s (17 kn) A/C speed: 101.3 m/s (197 kn) Ground speed: 109 m/s
	18:01:07	Channel marker?	Temp: 19° C
18:01:04	18:01:09	Turbidity change Turbid to the South	Side-looking TV count: 574
18:01:40	18:01:43-46	Breakers in shores	
18:02:00		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:08:50		Start record	Pass No. 2-105
18:08:07		IP	L-Band time: 6 s fast
18:09:06		Data on	SUSS time: OK
18:09:11	18:09:18	Shoreline	AOL time: OK
18:09:27	18:09:30-33	Foam due to breaking waves	Heading: 234°
18:09:28	18:09:34	Front w/patchy foam Turbidity boundary More turbid to the North Trend 90°	Wind: 260°; 6.7 m/s (13 kn) A/C speed: 97.7 m/s (190 kn)
18:09:40	18:09:47	Channel marker	Temp: 19° C
18:09:48	18:09:54	Front, turbidity boundary Turbid to the North Trend 80°	Side-looking TV count: 768
18:09:57	18:10:03-04	Front, turbidity boundary Turbid to the North Trend 85° (small boat)	
18:10:39	18:10:45-46	Striations	
18:10:57	15:11:03	Front (not visible) waves-roughness difference	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:11:01	18:11:06	Boat wake	
18:11:15	(not observed)	Front (not visible)	
18:12:06	18:12:11	Bridge Tunnel	
18:12:22		Data off	

Pass No. 2-105 (Concluded)

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:16:53		Start record	Pass No. 3-8N
18:17:30		IP (Beach?)	L-Band time: 6 s fast
18:19:08		Data on	SUSS time: 1 s fast
18:19:12		Slicks near ships	Heading: 045°
	18:20:15	Striations	Wind: 198°; 8.7 m/s (17 kn)
18:20:33	18:20:38	Front w/well-developed foam line Scalloped, horns point to the Southeast Turbid to the NW Trend 50°	A/C speed: 100.8 m/s (196 kn) Ground speed: 110 m/s Temp: 19° C
18:20:50		Data off	Side-looking TV count: 895

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:27:14	18:27:20	Beach	Pass No. 2-115
18:27:26	18:27:32	Front with patchy foam Irregular turbidity boundary Horns point to the South More turbid to the North Trend 90°	TV no data Assume same L-Band delay as pass 3-6N Heading: 231°
18:27:45	18:27:51	Front with slight foam Turbidity boundary More turbid to the North Trend 90°	Wind: 253°; 8.2 m/s (16 kn) A/C speed: 99.3m/s (193 kn)
18:28:07	18:28:13-14	Front - turbidity boundary More turbid to NE Trend 60°	Ground speed: 95 m/s Temp: 19° C
18:28:21	18:28:27	Front with patchy foam Irregular turbidity boundary Slightly more turbid to the N Trend 135°	Side-looking TV count: 1036
18:28:50	18:28:55	Front with slight foam Turbidity boundary More turbid to the North Trend 70°	
18:29:49	18:28:56-29:55	Striations	
18:29:55	18:30:01	Bridge Tunnel	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:34:14		Start record	Pass No. 3-9N
18:35:15		IP (Beach)	L-Band time: 7 s fast
18:36:57		Data on	SUSS time: 1 s fast
18:37:03		Front? Slick?	AOL time: OK TV time
18:37:22		Front (not visible)	Heading: 039°
	18:37:39	Turbidity change More turbid to the Southeast Trend 45°	Wind: 205°; 7.7 m/s (15 kn) A/C speed: 99.3 m/s (193 kn)
18:38:17	18:38:24	Striations	Ground speed: 111 m/s
18:38:22	18:38:29	Front w/well-developed foam Scalloped, horns pointing to the South Turbid to the North Trend 90°	Temp: 19° C Side-looking TV count: 1143
18:38:25	18:38:31	Channel Buoy	
18:38:34		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:43:50 (approx.)		IP	Pass No. 2-12S
18:44:41		Data on	L-Band time: 7 s fast
18:44:44		Shoreline	SUSS time: 1 s fast
18:45:02	18:45:08-9	Turbidity change More turbid to the North Trend 60°	AOL time: OK TV time Heading: 235°
18:45:05	18:45:13	Turbid band (not visible)	Wind: 255°; 8.7 m/s (17 kn)
18:45:21	18:45:29	Front w/patchy foam Horns pointing to the South More turbid to the North Trend 70°	A/C speed: 100.3 m/s (195 kn) Ground speed: 95 m/s
18:45:29	18:45:35	Small boats	Temp: 19° C
18:45:44	18:45:49	Striations	Side-looking TV count: 1265
18:45:51	18:45:59	Front w/patchy foam Slight more turbid to the North Trend 90°	
18:46:25	18:46:32	Striations	
18:46:34	18:46:41-42	Buoy	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-12S (Concluded)
18:46:41	18:46:48	Front w/foam line Weak turbidity boundary More turbid to the South? Trend 60°	
18:47:40	18:47:48	Bridge Tunnel	
18:47:55		Data off	
18:48:04		Front?	
18:49:42		Radio tower on South side	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:51:59		Start record	Pass No. 3-10N
18:52:46		IP (Beach)	L-Band time: 7 s fast
18:54:23		Data on	SUSS time: 2 s fast
18:54:31	18:54:38-39	Slick along channel?	AOL time: OK TV time
18:54:44		Front (not visible)	Heading: 041°
18:54:51	18:54:59	Turbidity patches	Wind: 220°; 6.7 m/s (13 kn)
	18:55:19	Striations	A/C speed: 99.3 m/s (193 kn)
	18:55:55	Striations	Ground speed: 110 m/s
18:55:52	18:55:59	Front with foam Irregular turbidity boundary Horns pointing to the South More turbid to the North Trend 90°	Temp: 19° C Side-looking TV count: 1362
18:55:54	18:56:01	Channel marker	
18:56:04		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:01:44		IP?	Pass No. 2-135
19:02:24		Data on	L-Band time: 7 s fast
19:02:30	19:02:39-40	Shoreline	SUSS time: 2 s fast
19:02:49	19:02:58-59	Whitecaps	AOL time: OK TV time
19:03:09	19:03:17	Front w/foam, horns? More turbid to North Trend 80° Buoy Small boat	Heading: 233° Wind: 258°; 7.7 m/s (15 kn) A/C speed: 100.3 m/s (195 kn)
19:03:31		Small front (not visible)	Ground speed: 92 m/s
	19:03:43	Slight foam?	Temp: 19° C
19:04:17		Front? (not visible)	Side-looking TV count: 1476
19:04:32		South edge of front	
	19:04:34	Channel marker	
	19:04:40	Channel marker	
	19:04:42	Weak foam line?	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-135 (Concluded)
19:05:43	19:05:43	Bridge Tunnel	
19:05:51		Data off	
19:07:25		Beach	
19:07:32		IP	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:10:31		IP	Pass No. 3-11N
19:12:12		Data on	L-Band time: 8 s fast
	19:12:26	Turbidity change More turbid to the South Trend 90°	SUSS time: 1 s fast AOL time: OK TV time
19:12:29	(not observed)	Ship wake	Heading: 039°
19:12:55-13:02	19:12:59-13:02	Front with patchy foam Turbidity boundary--irregular Turbid to the East Trend 180°	A/C speed: 220°; 7.2 m/s (14 kn) Ground speed: 111 m/s Temp: 19° C
19:13:15	19:13:23	Front w/patchy foam Slightly more turbid to the Northeast Trend 135°	Side-looking TV count: 1564
19:13:38	19:13:45-47	Front w/well-developed foam line Scallops, horns pointing to the South More turbid to the North Trend 90°	
19:14:13		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:19:18		IP	Pass No. 2-14S
19:20:30		Data on	L-Band time: 8 s fast
19:20:34		Shoreline	SUSS time: 1 s fast
19:20:53	19:20:53-54	Weak front Turbidity boundary More turbid to the North Trend 120°	AOL time: OK TV time A/C speed: 97.7 m/s (190 kn)
19:21:05	19:21:12-14	Front with well-developed foam line Horns pointing to the South More turbid to the North Trend 85° (Small boat) (<u>Osprey</u>)	Temp: 19° C Side-looking TV count: 1672
	19:21:20	Front-turbidity boundary More turbid to the South Trend 65°	
	19:21:23	Front--turbidity boundary Irregular boundary More turbid to the North Trend 110°	
19:22:02		Small front (not visible)	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-143 (Concluded)
19:22:16	19:22:25	Front w/foam line Slightly more turbid to the North Trend 60°	
19:22:30	19:22:38-39	Front w/foam line Turbidity boundary? Slightly more turbid to South?	
19:23:17	19:23:26	Bridge Tunnel	
	19:23:45	Front - turbidity boundary More turbid to the SE Trend 45°	
19:23:53	19:24:02	Small boat	
	19:24:58	Striations	
19:25:05	19:25:14	Buoy	
19:25:24	19:25:32	Beach	
19:25:26		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:29:52		IP	Pass No. 3-12N
19:31:30		Data on	L-Band time: 9 s fast
19:31:50		Chesapeake channel Front (not visible on TV or 35 mm)	SUSS time: 2 s fast AOL time: OK TV time
19:32:03		Chesapeake channel front (not visible on TV or 35 mm)	Flight research camera on Heading: 039°
	19:32:58	Striations	Wind: 227°; 6.2 m/s (12 kn)
19:32:50		Front near helicopter (not visible)	Ground speed: 104 m/s
19:33:00		Small front (not visible)	Side-looking TV count: 1767
19:33:05	19:33:14	Front with wavy foam line No turbidity change Trend 90° (not visible on TV)	
	19:33:16	Channel marker	
19:33:20		Front (not visible)	
19:33:48		Whitecaps on shoals	
	19:33:53	Striations	
19:33:57		Shoal exposed	
19:33:59		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:38:30		IP	Pass No. 2-15S
19:39:29		Data on	L-Band time: 9 s fast
19:39:34	19:39:44	Shoreline	SUSS time: 2 s fast
19:39:51	19:40:00	Whitecaps	AOL time: OK TV time
	19:40:09	Front--weak turbidity boundary Turbid to the South Trend 90°	Wind: 255°; 7.2 m/s (14 kn) A/C speed: 100.3 m/s (195 kn) Ground speed: 93 m/s
	19:40:13	Channel buoy	Temp: 19° C
19:40:11	19:40:20	Front w/strong foam line Turbidity boundary Horns point to the South Turbid to the North Trend 90°	Side-looking TV count: 000 Start Tape 3
	19:40:27	Front - turbidity boundary More turbid to SE Trend 60°	
	19:40:29	Front - turbidity boundary More turbid to the Northeast Trend 130°	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-15S (Concluded)
19:41:22	19:41:31	Front with well-developed foam line Horns pointing to the SE Slightly more turbid to the NW Trend 60°	
	19:41:44	Weak foam line Trend 90°	
	19:42:41	Bridge Tunnel	
	19:42:52	Slight turbidity change	
	19:44:00	Turbid band	
19:44:26	19:44:35	Beach	
19:44:27		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
		IP (none)	Pass No. 3-13N
19:50:50		Data on	L-Band time: 9 s fast
19:51:10		Wave line	SUSS time: 1 s fast
19:51:15		Front (not visible on TV or 35 mm)	AOL time: OK TV time
	19:51:40	Striations	Heading: 038°
19:52:11		Front (not visible on TV)	Wind: 235°; 7.7 m/s (15 kn)
		Striations	A/C sped: 97.7 m/s (190 kn)
19:52:11		Front (not visible on TV)	Temp: 20° C
19:52:15	19:52:25	Front w/foam line No turbidity change Trend 90°	Side-looking TV count: 281
19:52:35		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:58:31		IP	Pass No. 2-16S
19:59:27		Data on	L-Band time: 10 s fast
19:59:34	19:59:43	Shoreline	SUSS time: 2 s fast
19:59:54	20:00:03	Whitecaps	AOL time: OK TV time
	20:00:05	Turbid band	Heading: 232°
20:00:09		Weak front (not visible)	Wind: 255°; 8.2 m/s (16 kn)
20:00:14	20:00:23-24	Front w/irregular foam line Slightly more turbid to North Trend 90°	A/C speed: 97.7 m/s (190 kn) Ground speed: 92 m/s
20:01:27	20:01:37	Front w/foam Horns pointing to the South More turbid to North Trend 90°	Temp: 19° C Side-looking TV count: 507
20:01:44	20:01:54	Front w/weak turbidity boundary More turbid to South Trend 90°	
20:02:37	20:02:47	Bay Bridge	
	20:03:37	Turbidity change More turbid to the West Trend 165°	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 2-16S (Concluded)
20:03:53	20:04:06	Turbidity change More turbid to Southeast Trend 45°	
	20:04:14	Turbidity change More turbid to the NW Trend 45°	
20:04:21	20:04:31	Small boat	
20:04:29	20:04:37	Beach	
20:04:31		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:07:39		Start record--data on	Pass No. 3-14N
20:07:55	20:08:05	IP? Beach	L-Band time: 10 s fast
20:08:23	20:08:34	Small boat wake Ship to right	SUSS time: 2 s fast
20:08:35	20:08:45	Ship	AOL time: OK TV time
20:08:39	20:08:49	Small boat	Heading: 041°
20:08:46		Ship to right	
20:08:57	20:09:07	Ship wake	Wind: 225°; 100.8 m/s (14 kn)
20:09:05	20:09:16	Ship at nadir	
20:09:12	20:09:24	Ship wake	A/C speed: 97.2 m/s (189 kn)
20:09:27	20:09:36	Ship to left	
20:10:02		Front (not visible on TV or 35 mm)	Temp: 19° C
	20:10:26	Striations	Side-looking TV count: 664
20:10:27	20:10:37	Ship wake? Trend 45°	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 3-14N (Concluded)
20:10:56	20:11:06	Weak turbidity change More turbid to North Trend 90°	
	20:11:11-12	Front w/well-developed foam line Scallops, horns pointing to the South More turbid to the South Trend 100°	
20:11:25		Data off	

10/08/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
		Start record (missed IP)	Pass No. 2-17S
20:17:31		Data on	AOL time: OK TV time
20:17:38	20:17:41	Beach	Heading: 234°
	20:18:14	Front with turbidity boundary Turbid to the South Trend 125°	Wind: 260°; 8.2 m/s (16 kn) A/C speed: 97.7 m/s (190 kn) Ground speed: 89 m/s
20:18:06	20:18:17	Front w/weak foam Small scallops, horns pointing into the clear H ₂ O Slightly more turbid to the NW Trend 60°	Temp: 19° C Side-looking TV count: 830
20:19:19	20:19:31	Front w/foam line Slightly more turbid to the South Trend 100°	
20:19:33	20:19:44	Front w/turbidity boundary More turbid to the South Trend 135°	
20:20:10	20:20:21	Bay Bridge	
	20:22:44	Beach Tape stops abruptly - no data off time	

10/08/80 (Concluded)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:25:23		IP (no data on command recorded)	Pass No. 3-15N Heading: 041°
	20:26:28	Front w/foam displaced to the North of the turbidity boundary More turbid to the South Trend 50° Roughness difference?	Wind: 220°; 6.7 m/s (13 kn) Side-looking TV count: 953
20:26:48	20:26:59	Ship	
	20:27:15	Debris?	
20:27:37	20:27:49	Foam - front breaking up? Trend 90°	
20:28:37	(not observed)	Foam line (not visible)	
	20:28:52	Turbidity change More turbid to the South Trend 120°	
	20:29:16-17	Weak foam line No turbidity change Trend 90°	
20:29:17	20:29:27	Beach	
20:29:22		Data off	

10/09/80

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:09:00	No 35 mm coverage	Start Record	Pass No. 12-1S
18:09:57		IP	L-Band time: 6 s fast
18:11:03		Data On	SUSS time: OK TV time
18:11:09		Shoreline	AOL time: OK TV time
18:11:31		Roughness change	Heading: 234°
18:12:42		Chesapeake Channel Front (not visible)	Wind: 275°; 5.7 m/s (11 kn) Ground speed: 94 m/s
18:13:10		Bridge Tunnel	Temp: 24° C
18:14:01		Turbidity change	Side-looking TV count: 1123
18:14:11		Ship to left	
18:15:01		Color change	
18:15:22		Shoreline	
18:15:24		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:18:00	No 35 mm coverage	Start record	Pass No. 13-1N
18:18:52		IP	L-Band time: 5 s fast
18:19:28		Data on boat wake	SUSS time: 1 s fast
18:20:12		Ship	AOL time: OK TV time
18:20:47		Ship Front to left 2.4 km (1.5 mi)	Heading: 043°
18:21:24		Turbidity line (not vis. on TV)	Wind: 259°; 4.6
18:22:03		Turbidity line (with boat?)	Ground speed: 109 m/s
18:22:24		Front	Temp: 24° C
18:22:27		Light Tower	Side-looking TV count: 1227
18:22:34		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:27:00		Start record	Pass No. 12-2S
No video coverage	18:29:05	Beach	AOL time: OK TV time
	18:29:16	Turbidity change More turbid to the North Trend 90°	Ground speed: 106 m/s Temp: 24 °C
	18:29:28	Turbid band	
	18:29:29-35	Boat wakes	
	18:29:43	Turbidity change More turbid to the North Trend 90°	
	18:30:27	Turbidity change More Turbid to the North Trend 90°	
	18:30:40	Weak turbidity change More Turbid to the East Trend 30°	
	18:31:25	Bay Bridge Tunnel	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:35:00		Start record	Pass No. 13-2N
18:35:34		IP	L-Band time: 6 s fast
18:37:12		Data on	SUSS time: 1 s slow
18:37:20	18:37:26	Ship to left	AOL time: OK TV Time
18:37:38		Chesapeake channel front (not visible on TV or 35 mm)	Audio poor to nonexistent
	18:38:18	Turbidity patch	Heading: 040°
18:38:37	18:38:42	Striations	Wind: 239°; 4.6 m/s (9 kn)
	18:38:45	Channel buoy	A/C speed: 108 m/s (210 kn)
	18:38:48	Channel buoy	Ground Speed: 107 m/s
	18:39:14	Turbidity change More turbid to the SE Trend 45°	Temp: 23° C
18:39:20	18:39:23	Striations	Side-looking TV count: 1436
18:39:21		Data Off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:44:45		Start record	Pass No. 12-3S
18:45:34		IP	I-Band time: 6 s fast
18:46:20		Data on	SISS time: 1 s slow
18:46:32	18:46:39	Beach	AOL time: OK TV time
	18:46:52-54	Breaking waves	Audio poor to terrible
18:46:58		Foam line? (Not visible on TV or 35 mm)	Heading: 130°
	18:47:06	Channel marker	Wind: 240°; 2.1 m/s (4 kn)
18:47:06	18:47:13	Front--turbidity boundary More turbid to North Trend 30° (<u>ODU-1</u> and <u>Osprey</u> with all 10 Cards)	Ground speed: 102 m/s
18:47:13	18:47:20	Turbidity change More turbid to the South	Temp: 23° C
18:47:20	18:47:24	Turbidity change Slightly more turbid to the North Trend 90°	
18:48:05	18:48:08	Chesapeake channel front-turbidity boundary, more turbid to North Trend 80°	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
	18:48:20	Channel buoy	
18:49:14	18:49:21	Bridge Tunnel	
	18:49:43	Boat wake	
18:49:36		Data off	

Pass no. 12-3S (Concluded)

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
18:54:00		Start Record	Pass No. 13-3N
18:54:40		IP	L-Band time: 7 s fast
18:56:13		Data On	SUSS time: 1 s slow
18:56:20	18:56:27	Ship	AOL time: OK TV time
18:56:46		Striation (not visible)	A/C speed: 108 m/s (210 kn)
18:57:40		South Channel	Ground speed: 111 m/s
18:57:42		Menhaden boats	Temp: 23° C
	18:57:46	Boats	Side-looking TV count: 85
	18:57:48	Turbid patches	
	18:57:52	Buoy Front w/foam line Horns pointing to the South More turbid to the North Trend 90°	
18:58:23		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:14:00		Start record	Pass No. 12-4S
19:14:51		IP	L-Band time: 7 s fast
19:15:41		Data on	SUSS time: 1 s slow
19:15:53		Buoy (not visible)	AOL time: OK TV time
	19:16:01	Beach	Heading: 233°
19:16:12		Foam line (not visible)	Wind: 247°; 3.1 m/s (6 kn)
	19:16:29	Channel buoy	A/C speed: 108 m/s (210 kn)
19:16:28	19:16:34	Front with foam Strong turbidity boundary Horns pointing to the South More turbid to the North Trend 80° (<u>ODU-1</u> or <u>Osprey?</u>)	Ground speed: 104 m/s Temp: 24° C Side-looking TV count: 574
18:16:36	18:16:43	Weak turbidity boundary More turbid to North Trend 60° (not vis. on TV)	
	18:16:49	Front w/weak foam More turbid to West Trend 35° (Boat trail?)	
19:17:07		Turbidity change (not visible)	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
			Pass No. 12-4S (Concluded)
19:17:17		Turbidity change (not visible)	
19:17:31		Turbidity change (not visible)	
	19:18:34	Weak foam line - striation	
19:18:30	19:18:39	Bridge Tunnel	
19:18:43		Foam line? (not visible)	
	19:19:07	Foam line and buoy	
19:19:13		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:20:30		Start record	Pass No. 13-4N
19:20:56		IP	L-Band time: 8 s fast
19:22:42		Data on	SUSS time: OK TV time
19:22:56		Chesapeake channel Front (not visible)	AOL time: OK TV time
19:23:06		Slick?	IP at Bridge Tunnel/land Video poor
19:24:00		Turbidity change (not visible)	Heading: 043°
19:24:06		Front? (not visible)	Wind: 247°; 4.6 m/s (9 kn)
19:24:07		Boat? Buoy?	Ground speed: 109 m/s
	19:24:08	Wake from boat	Side-looking TV count: 667
	19:24:14	Front w/patchy foam Irregular turbidity boundary More turbid to the North	
	19:24:45	Striations	
19:24:35		Data off	
19:24:49		Beach	
19:25:33		Lighthouse	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:24:00		Start record	Pass No. 12-55
19:30:09		IP	L-Band time: 8 s fast
19:31:02		Data on	SUSS time: 1 s slow
19:31:18	19:31:27	Beach	AOL time: OK TV time
18:31:29		Front (not visible)	Heading: 233°
19:31:31		Front (not visible)	Wind: 265°; 2.6 m/s (5 kn)
	19:31:48	Channel buoy	A/C speed: 108 m/s (210 kn)
	19:31:53	Foam line?	Ground speed: 104 m/s
19:32:13		Front (not visible)	Side-looking TV count: 844
	19:32:18	Weak foam line?	
19:32:36		Striation	
19:32:49		Chesapeake channel front(?) (not visible)	
19:33:00		Chesapeake channel front (not visible)	
19:33:34	19:33:42	Bridge Tunnel	
19:33:57		Data off	

10/09/86 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:35:30		Start record IP (missed)	Pass No. 13-5N
19:37:07		Data on	L-Band time: 8 s fast
19:37:18	19:37:26	Ship	SUSS time: 1 s slow
19:37:08-18		Series of slick lines (not vis. on 35 mm or TV)	AOL time. OK TV time
19:37:13		Striation (not visible)	Side-looking TV count: 844
19:37:25		Striation (not visible)	Last pass with 35 mm coverage
19:38:27		Front with foam Turbidity boundary More turbid to the North Trend 90° (Sample ships)	
	19:38:29	Striations	
	19:38:34	Front w/well-developed foam line-turbidity boundary Scallops, horns point to the South More turbid to the North Trend 90°	
19:38:52		Data off	
19:39:38		Beach	
19:39:53		Lighthouse	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:46:23	No 35 mm coverage	IP	Pass No. 12-6S
19:46:30		Start record	L-Band time: 9 s fast
19:47:14		Data on	SUSS time: OK TV time
19:47:27		Beach	AOL time: OK TV time
19:47:41		Front (not visible)	Heading: 231°
19:47:48		Front (not visible)	Wind: 257°; 3.1 m/s (6 kn)
19:47:55		Front (not visible)	Ground speed: 1.05 m/s
19:48:21		Foam line (not visible)	Side-looking TV count: 1089
19:48:24		Weak foam line (not visible)	
19:48:55		Weak front (not visible)	
19:49:08		South side of front (not visible)	
19:49:53		Bridge Tunnel	
19:50:12		Foam line (not visible)	
19:50:26		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
19:51:30	No 35 mm coverage	Start record	Pass No. 13-6N
19:51:44		IP	L-Band time: 9 s fast
19:53:25		Data on	SUSS time: OK TV time
19:53:33		Slick	AOL time: OK TV time
19:54:21		Color change (not vis. on TV)	Heading: 043°
19:54:47		Turbidity line with foam (not vis. on TV)	Wind: 205°; 4.1 m/s (8 kn)
19:55:00		Foam line (not visible)	A/C speed: 102.9 m/s (200 kn)
19:55:07		Data off	Ground speed: 106 m/s
			Temp: 23° C
			Side-looking TV count: 1147

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:03:00	No 35 mm coverage	Start record	Pass No. 12-7S
20:03:55		IP	SUSS time: OK TV time
20:04:55		Data on	AOL time: OK TV time
20:05:01		Beach	Heading: 232°
20:05:31		Turbidity line (not vis. on TV)	Wind: 200°; 2.1 m/s (4 kn)
20:05:54		Turbidity line w/foam (not vis. on TV)	Ground speed: 103 m/s
20:06:33		Slicks (weak) (not vis. on TV)	Side-looking TV count: 1323
20:06:46		Front, Chesapeake channel (not vis. on TV)	
20:07:22		Bridge Tunnel	
20:07:50		Front w/foam (not vis. on TV)	
20:08:00		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:04:00	No 35 mm coverage	Start record	Pass No. 12-7S
20:03:55		IP	SUSS time: OK TV time
20:04:45		Data on	AOL time: OK TV time
20:05:01		Beach	Heading: 232°
20:05:31		Turbidity line (not vis. on TV)	Wind: 200°; 2.1 m/s (4 kn)
20:05:54		Turbidity line w/foam (not vis. on TV)	Ground speed: 103 m/s
20:06:33		Slicks (weak) (not vis. on TV)	Side-looking TV count: 1323
20:06:46		Front, Chesapeake channel (not vis. on TV)	
20:07:22		Bridge Tunnel	
20:07:50		Front w/foam (not vis. on TV)	
20:08:00		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:10:00	No 35 mm coverage	Start record IP-traffic problems Missed IP back on line 10:34	Pass No. 13-7N L-Band time: 9 s fast SUSS time: OK TV time
20:11:40		Data on	AOL time: OK TV time
20:11:49		Ship	Heading: 044°
20:12:02		Chesapeake channel line weak (not vis. on TV)	Wind: 200°; 4.6 m/s (9 kn)
20:12:15		North edge C.C. line weak (not vis. on TV)	A/C speed: 102.9 m/s (200 kn)
20:12:43		Foam strong (not vis. on TV)	Ground speed: 107 m/s
20:12:59		Fronts	Temp: 23° C
20:13:04			Side-looking TV count: 1394
20:13:09		Boats	
20:13:11			
20:13:23		Data off	
20:14:37		Lighthouse	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:17:30		Start record	Pass No. 12-8S
20:18:39		IP	L-Band time: 10 s fast
20:19:23		Data on	SUSS time: OK TV time
20:19:53		Beach	AOL time: OK TV time
20:20:04		Weak front (not vis. on TV)	Heading: 229°
20:20:22		Weak front (not vis. on TV)	Wind: 220°; 2.6 m/s (5 kn)
20:20:30		Front (not vis. on TV)	Ground speed: 96 m/s
20:20:48		Front (not vis. on TV)	Side-looking TV count: 1504
20:20:51		Front (not vis. on TV)	
20:21:17		Front (not vis. on TV)	
20:21:30		Chesapeake channel slick (not vis. on TV)	
20:21:33		Weak slick (not vis. on TV)	
20:22:20		Bridge tunnel	
20:22:50		James River front edges	
20:23:02			
20:23:10		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:24:45	No 35 mm coverage	Start record IP (missed-changed tapes)	Pass No. 13-8N
20:25:54		Data on	L-Band time: 10 s fast
20:25:44		N Chesapeake channel front weak (not vis. on TV)	SUSS time: OK TV time AOL time: OK TV Time
20:26:43		Slick w/foam (not vis. on TV)	A/C speed: 96.2 m/s (187 kn)
20:26:57		Slick (not vis. on TV)	Ground speed: 102 m/s
20:27:03		Slick with boat (not vis. on TV)	Temp: 23° C
20:27:42		Surf	Side-looking TV count: 1551
20:27:44		Beach	
20:27:56		Marsh Creek	
20:28:00		Data off	
20:28:38		Lighthouse	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:32:00	No 35 mm coverage	Start record	Pass No. 12-9S
20:32:24		IP (outside view of TV--off to right of flight line)	L-Band time: 10 s fast
20:33:12		Data on	SUSS time: OK TV time
20:33:35		Beach	AOL time: OK TV time
20:34:05		Boat out of picture	Heading: 231°
20:35:12		Chesapeake channel front (weak) (not vis. on TV)	Wind: 230°; 2.6 m/s (5 kn)
20:35:27		Front (Not vis. on TV)	Ground speed: 99 m/s
20:36:08		Bridge Tunnel	Side-looking TV count: 1660
20:36:50		Data off	

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:37:58	No 35 mm coverage	Bridge	Pass No. 13-9N
20:38:00		Start record IP (missed)	L-Band time: 11 s fast
20:39:29		Data on	SUSS time: 1 s fast
20:39:36		Slick south Chesapeake channel (not vis. on TV)	AOL time: OK TV time
20:39:54		Foam line On North C.C. (not vis. on TV)	Audio poor on video
20:40:52		Front (not vis. on TV)	Heading: 042°
20:40:57		Boat/front (not vis. on TV)	Wind: 200°; 3.6 m/s (7 kn)
20:41:25		Data off	Ground Speed: 104 m/s
20:42:31		Lighthouse	Side-looking TV count: 1706

10/09/80 (Continued)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:45:30	No 35 mm coverage	Start record	Pass No. 12-10S
20:46:05		IP (off to the right of screen)	L-Band time: 11 s fast
20:46:53		Data on	SUSS time: 1 s fast
20:47:12		Beach	AOL time: OK TV time
20:47:43		Wakes on front (not vis. on TV)	Audio poor on video
20:47:53		Foam line (not vis. on TV)	Heading: 200°
20:48:37		Front to foam (not vis. on TV)	Wind: 265°; 2.6 m/s (5 kn)
20:48:53		N Chesapeake channel front (not vis. on TV)	Ground speed: 98 m/s
20:49:07		S Chesapeake channel front (not vis. on TV)	Side-looking TV count: 84 (Tape #4)
20:49:55		James River front (not vis. on TV)	
20:50:33		Data off	

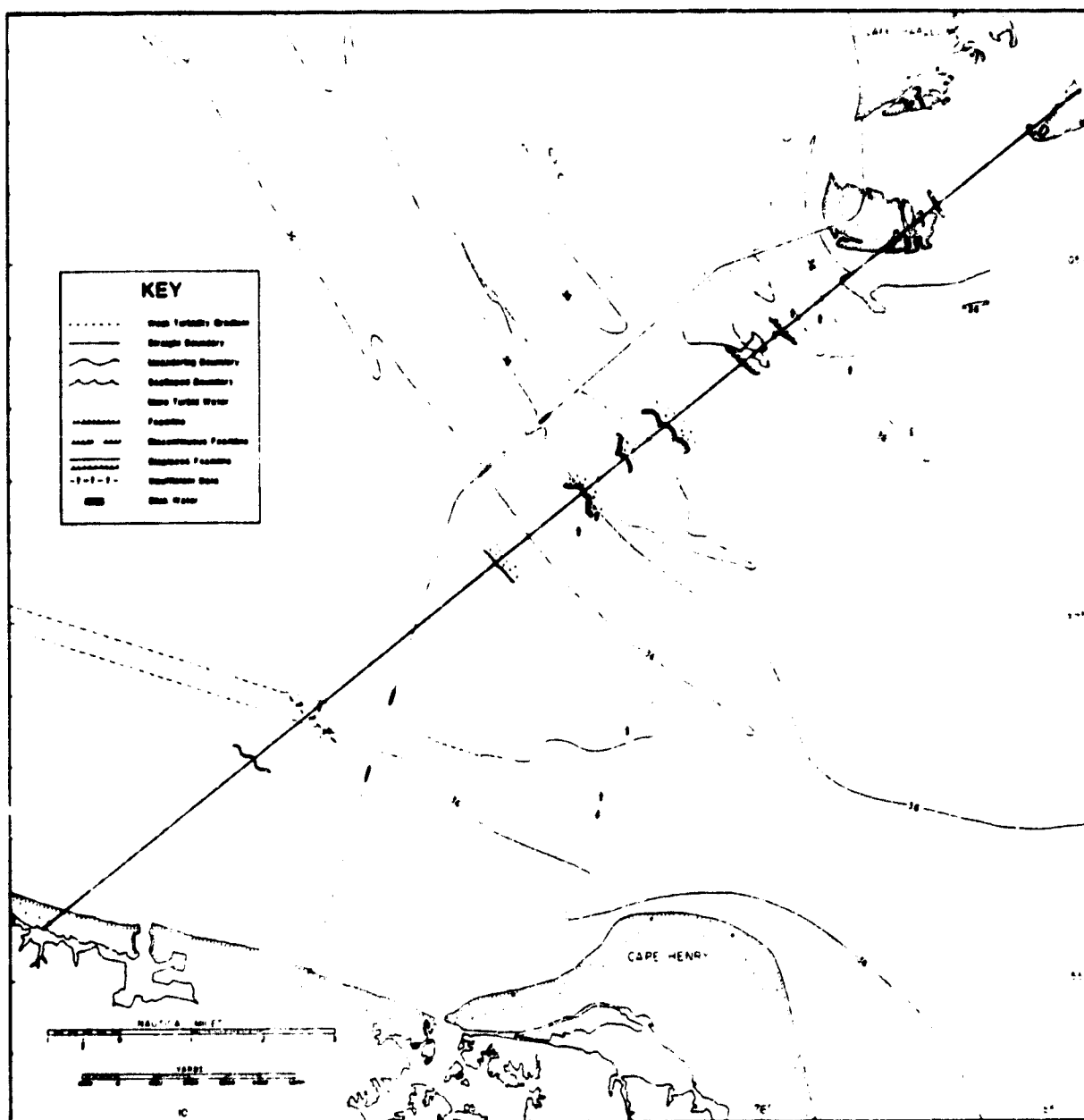
10/09/80 (Concluded)

<u>TIME (TV)</u>	<u>TIME (35 mm)</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
20:51:15		Start record	Pass No. 13-10N
20:51:27		IP (missed IP passed over bridge North of toll plaza)	L-Band time: 11 s fast SUSS time: 1 s fast
20:53:09		Data on	AOL time: OK TV time
20:53:22		Slick at N Chesapeake Channel front (not vis. on TV)	Audio poor on video
20:53:39		Slick (just North of channel) (not vis. on TV)	Heading: 038° Wind: 247°; 1.5 m/s (3 kn)
20:54:03		Front (not vis. on TV)	A/C speed: 97.7 m/s (190 kn)
20:54:08		Foam line (not vis. on TV)	Ground speed: 102 m/s
20:54:24		Front (not vis. on TV)	Temp: 23° C
20:54:30		Front (North channel) (not vis. on TV)	Side-looking TV count: 196
20:54:53		Data off	

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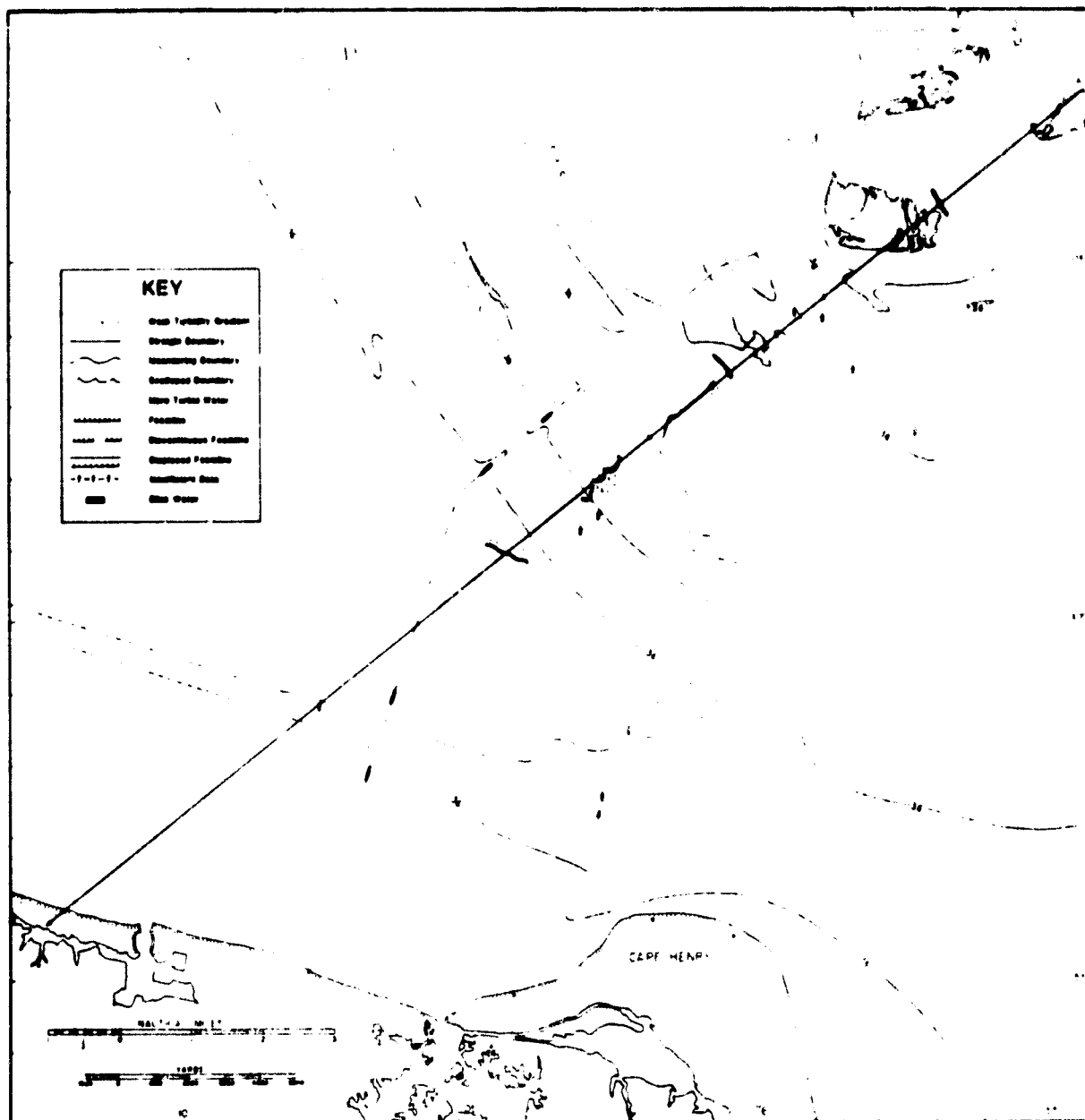
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PASS NO 2-1S
TIME 15:16:50
TIDE 1810

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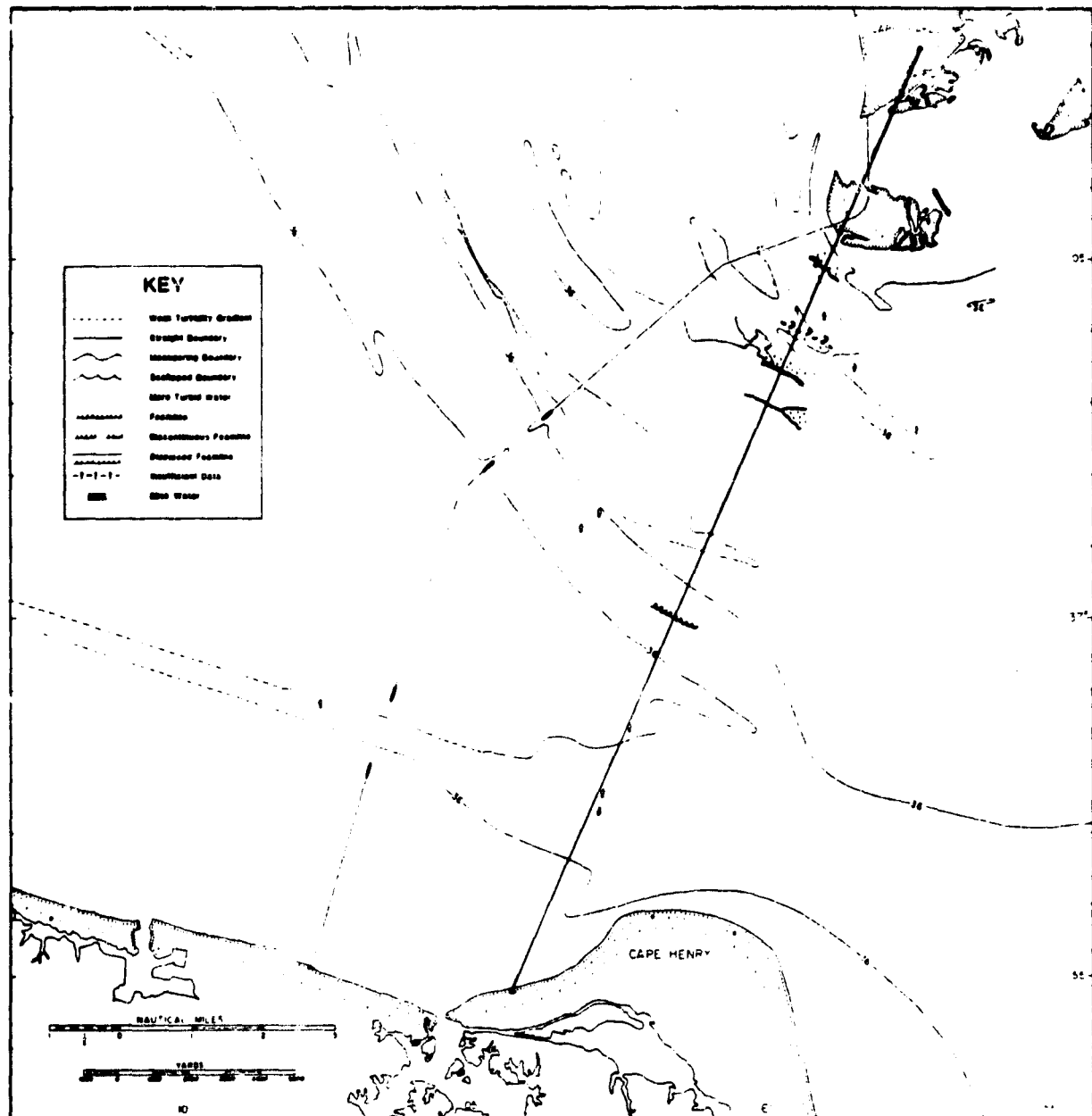
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 TIDE 1810

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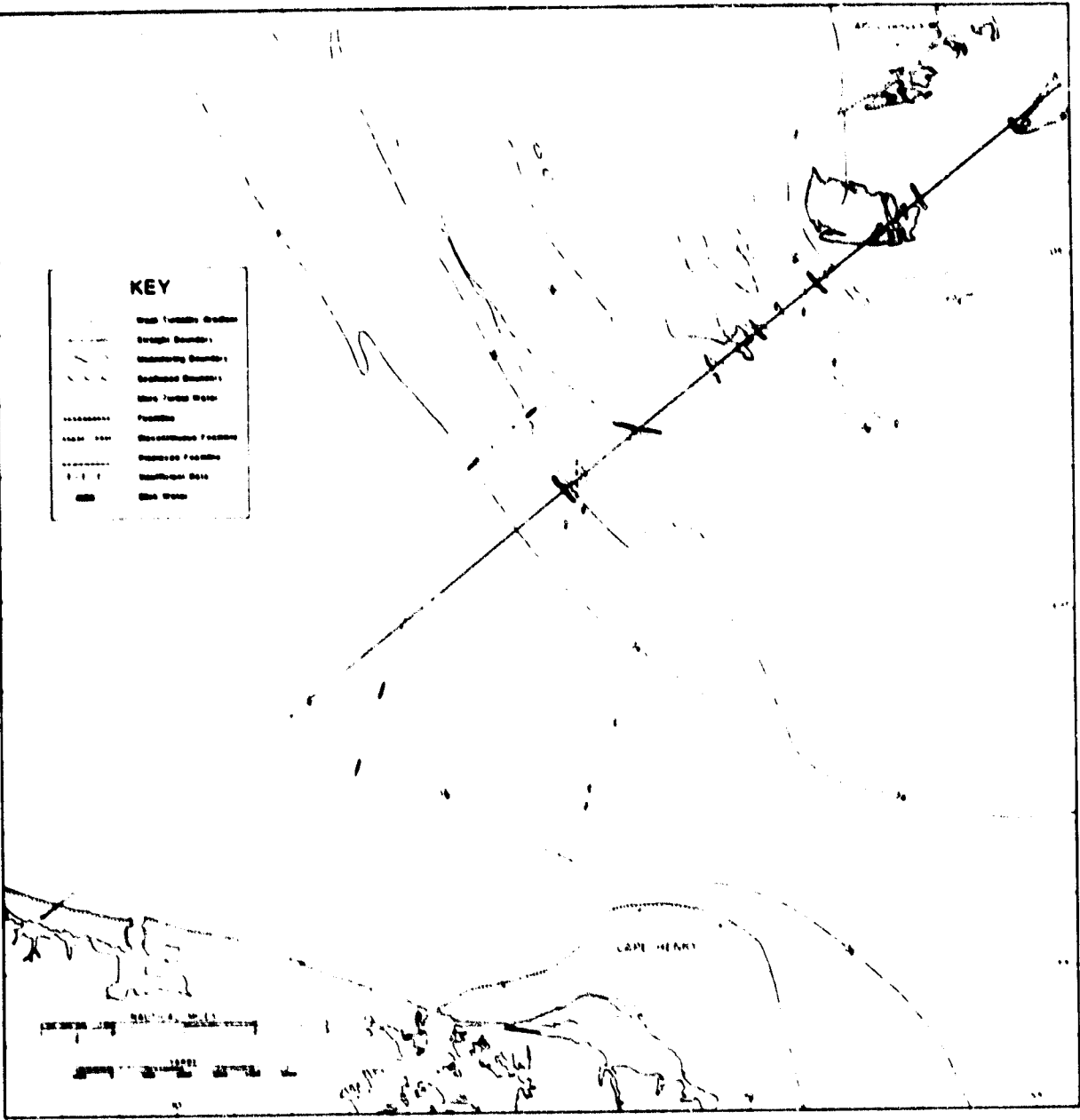
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TIDE 1810



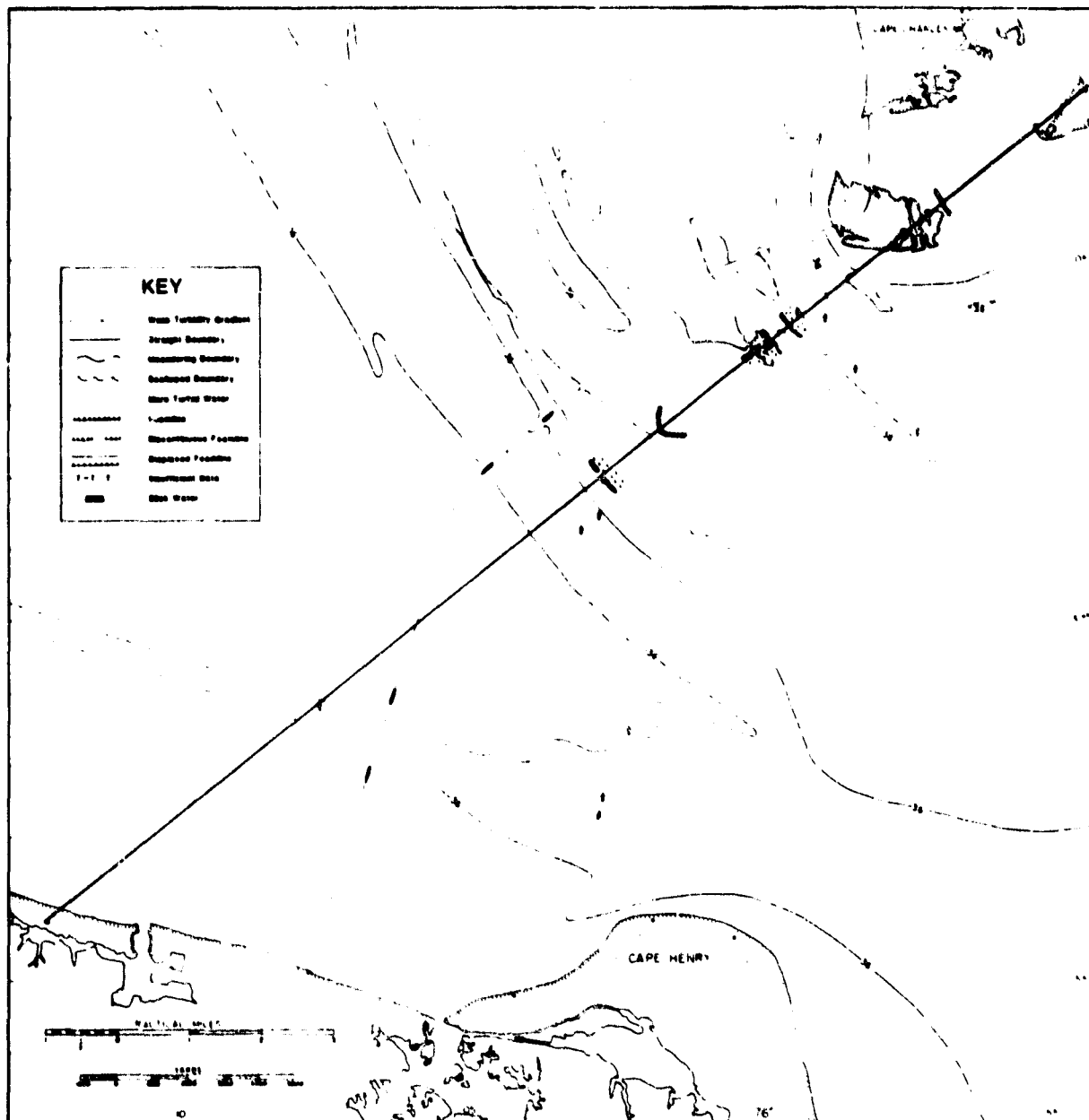
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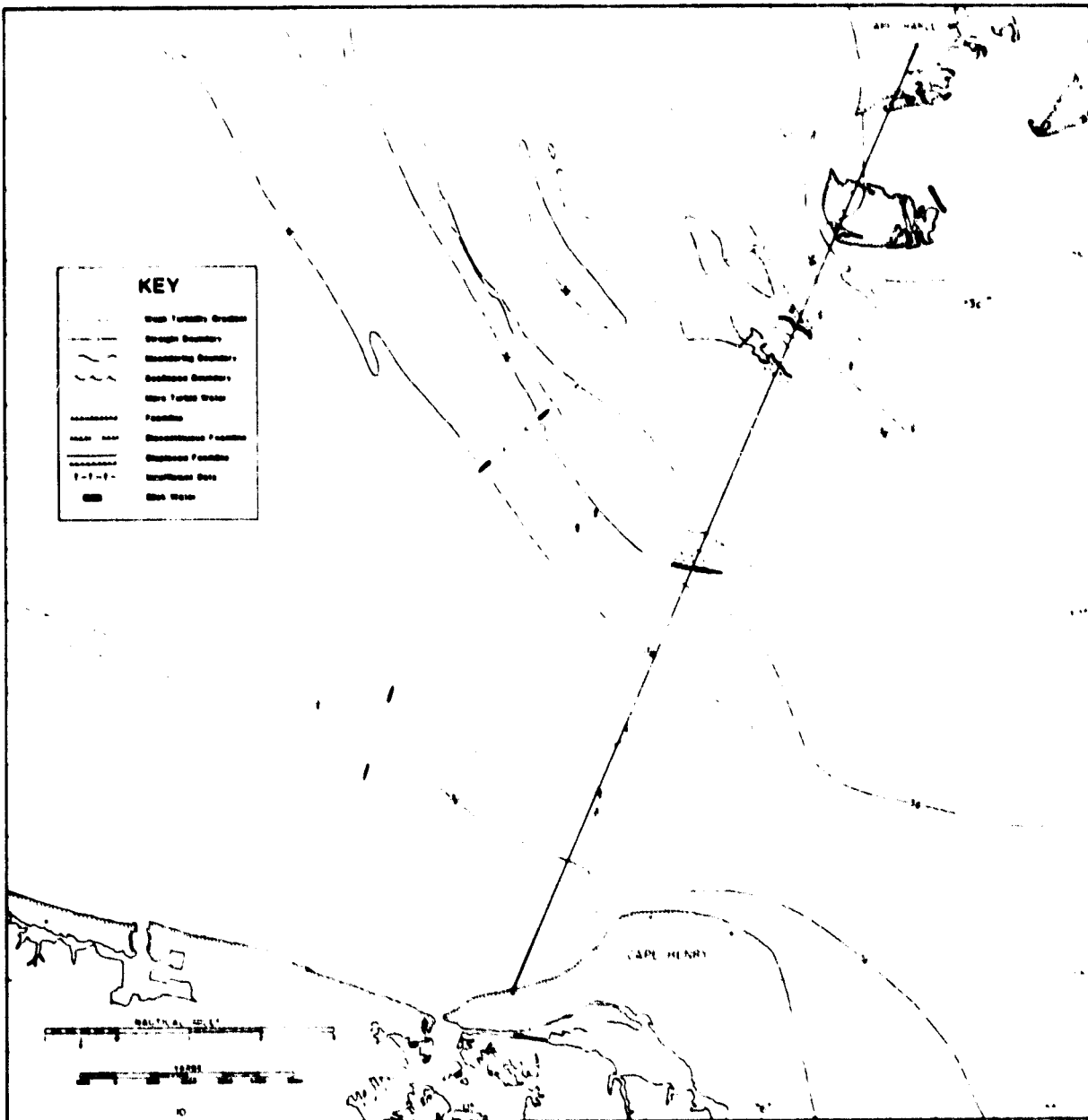
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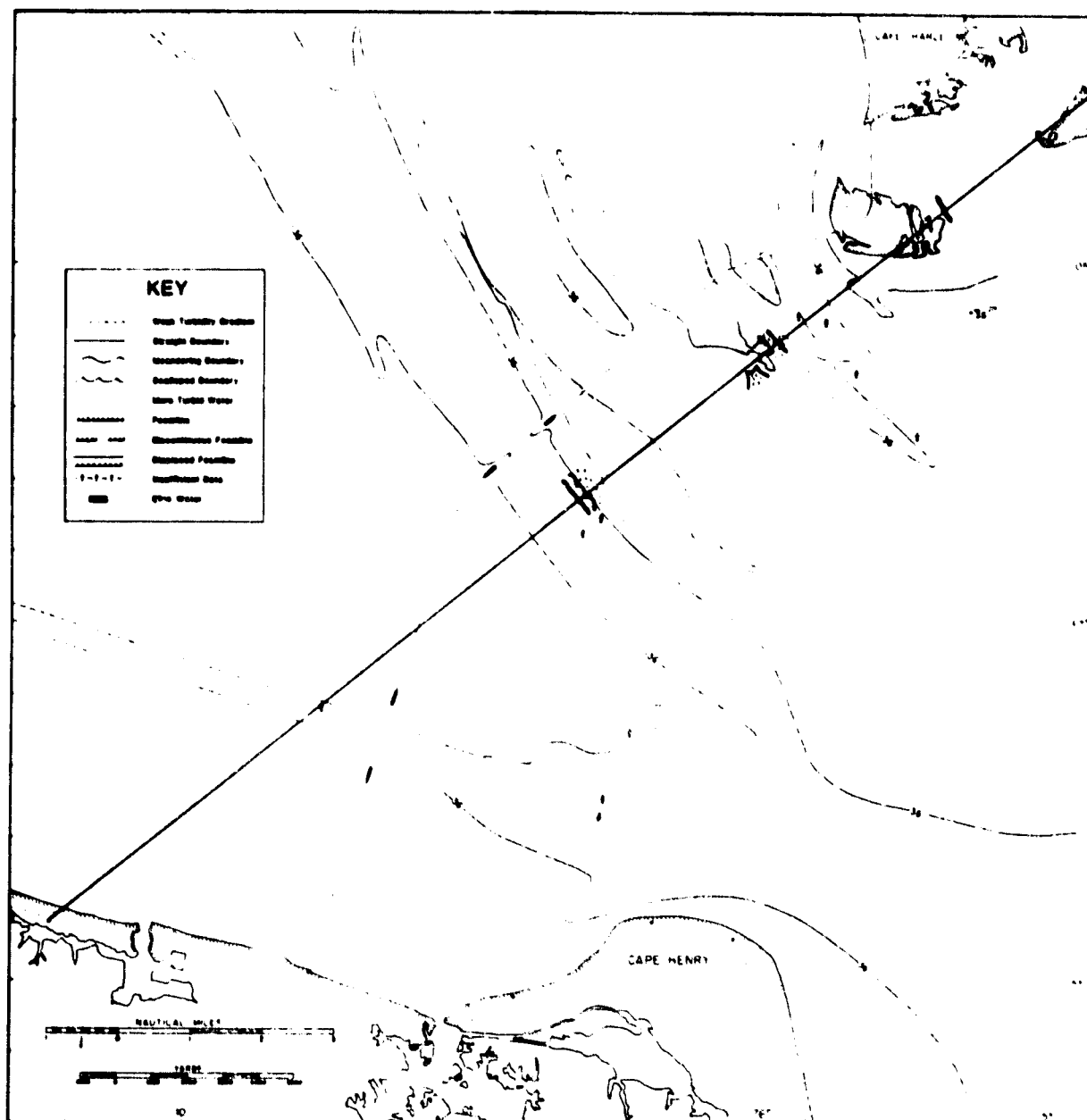
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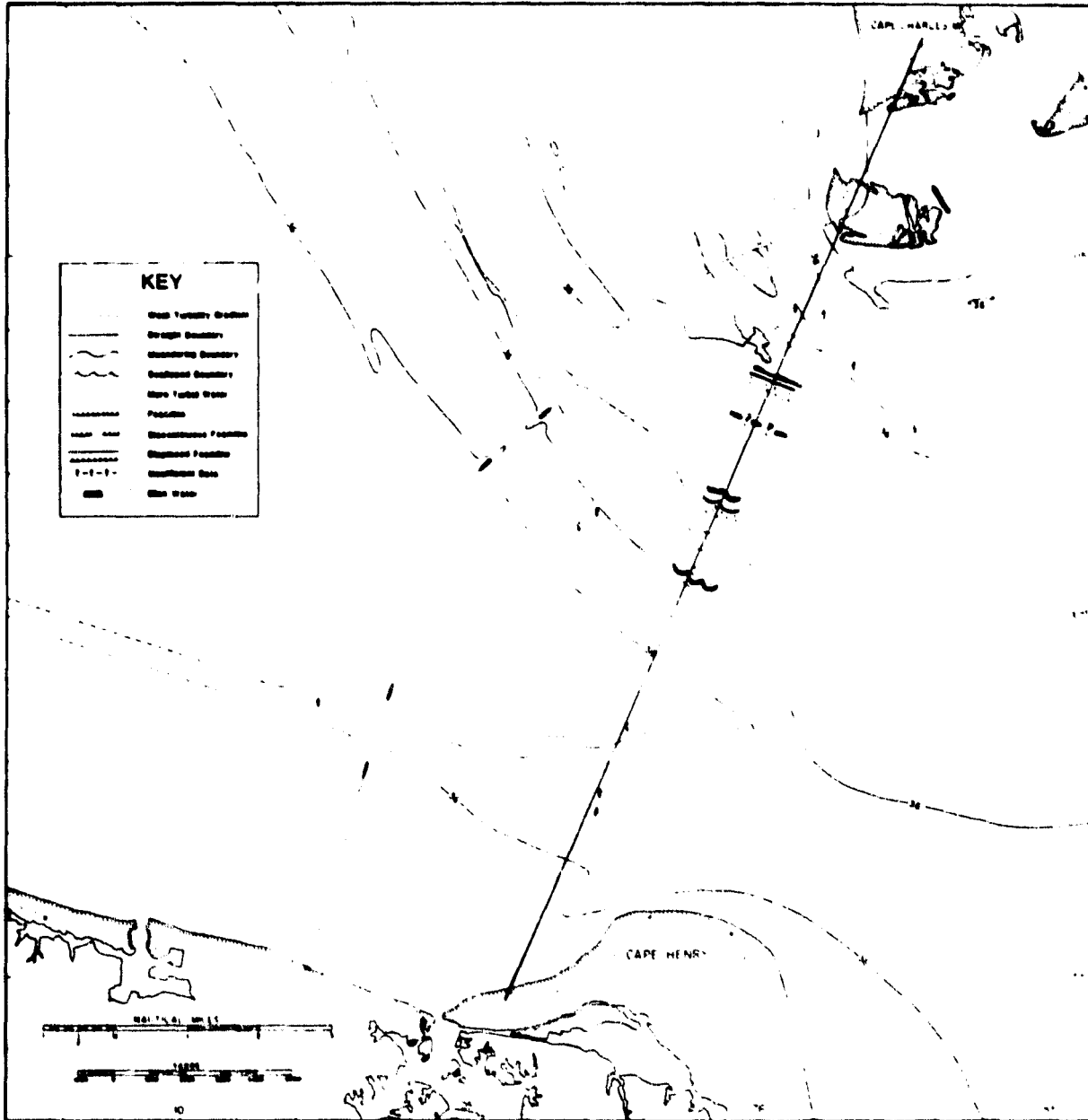
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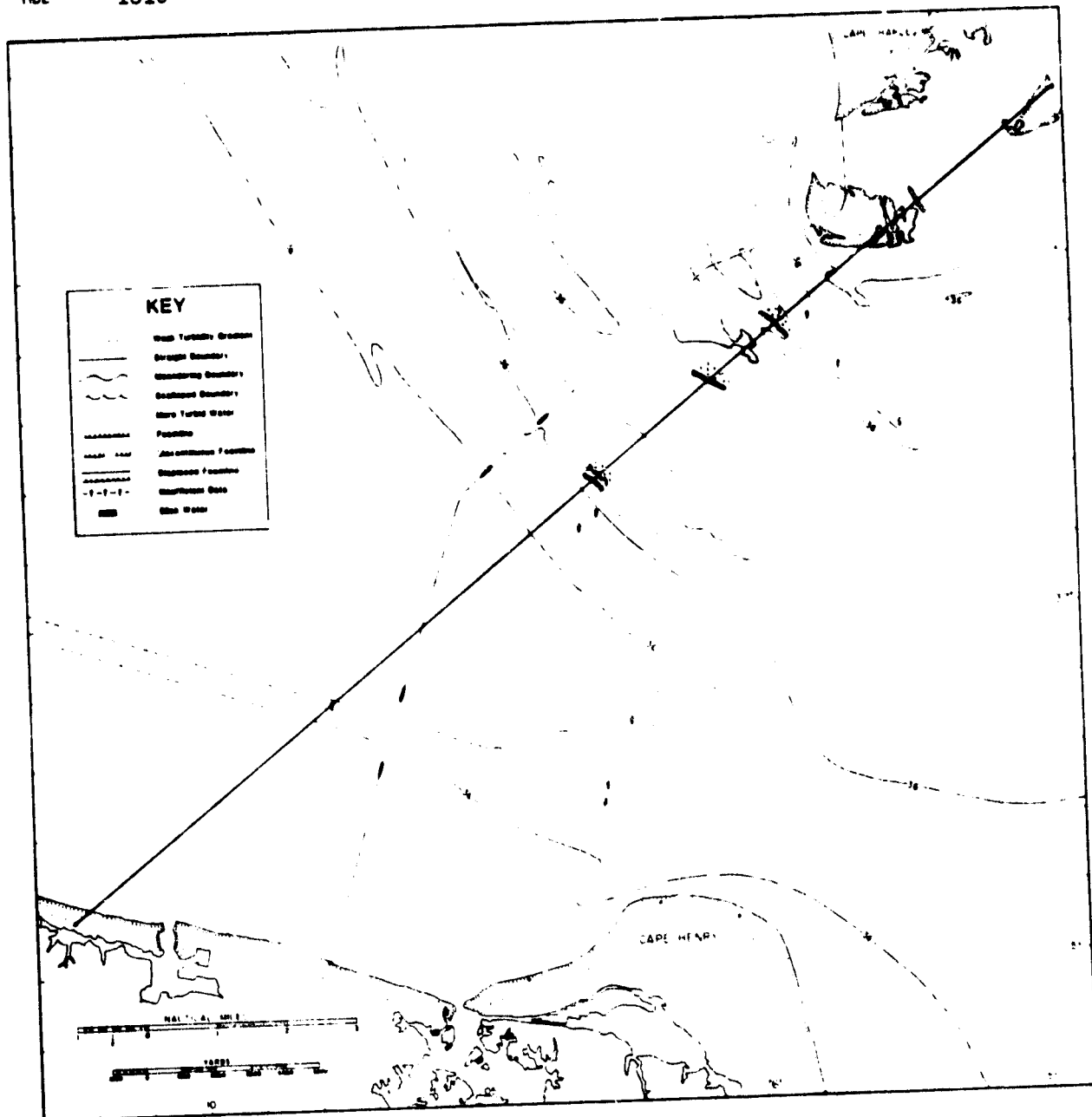
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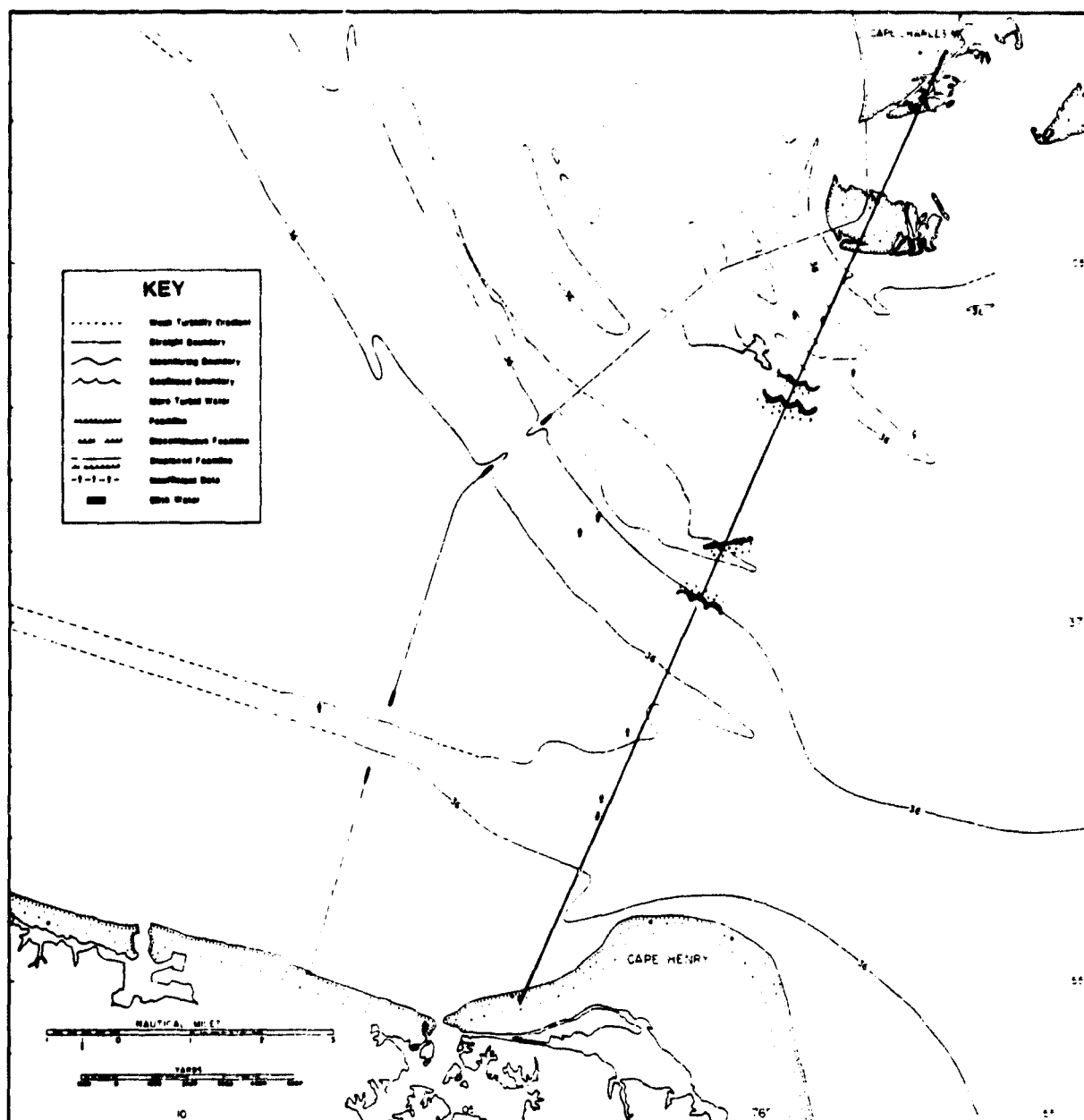
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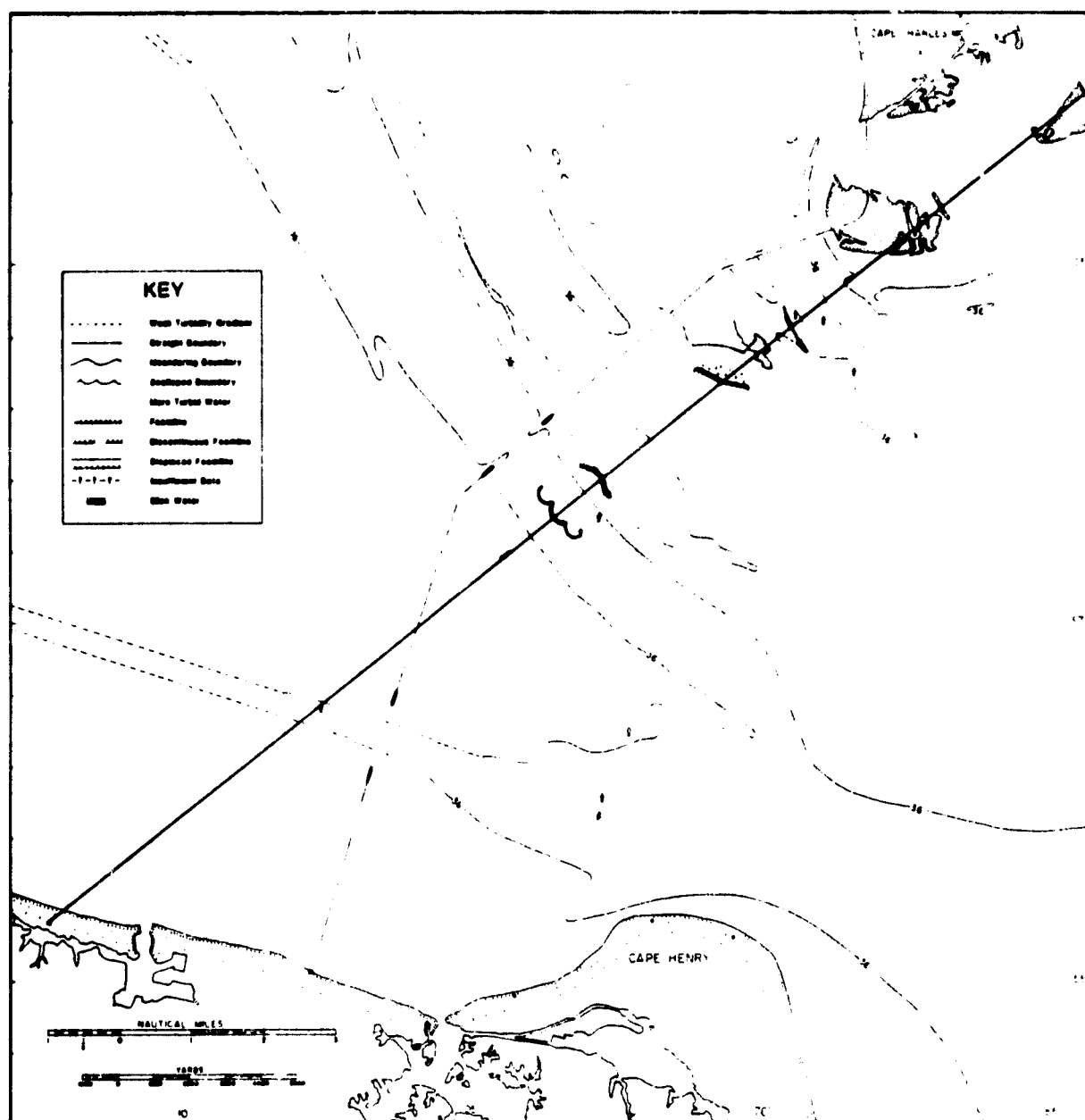
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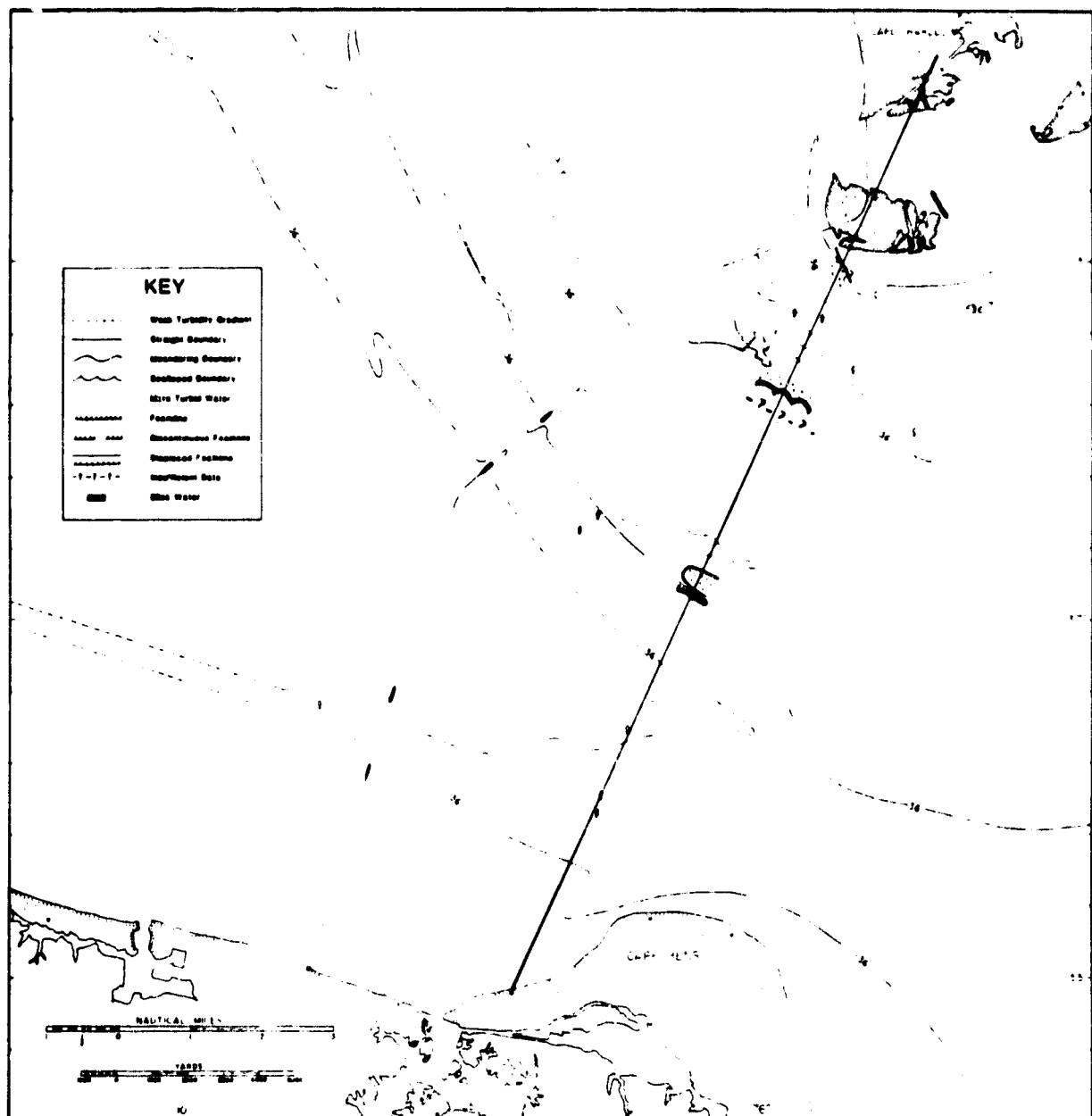
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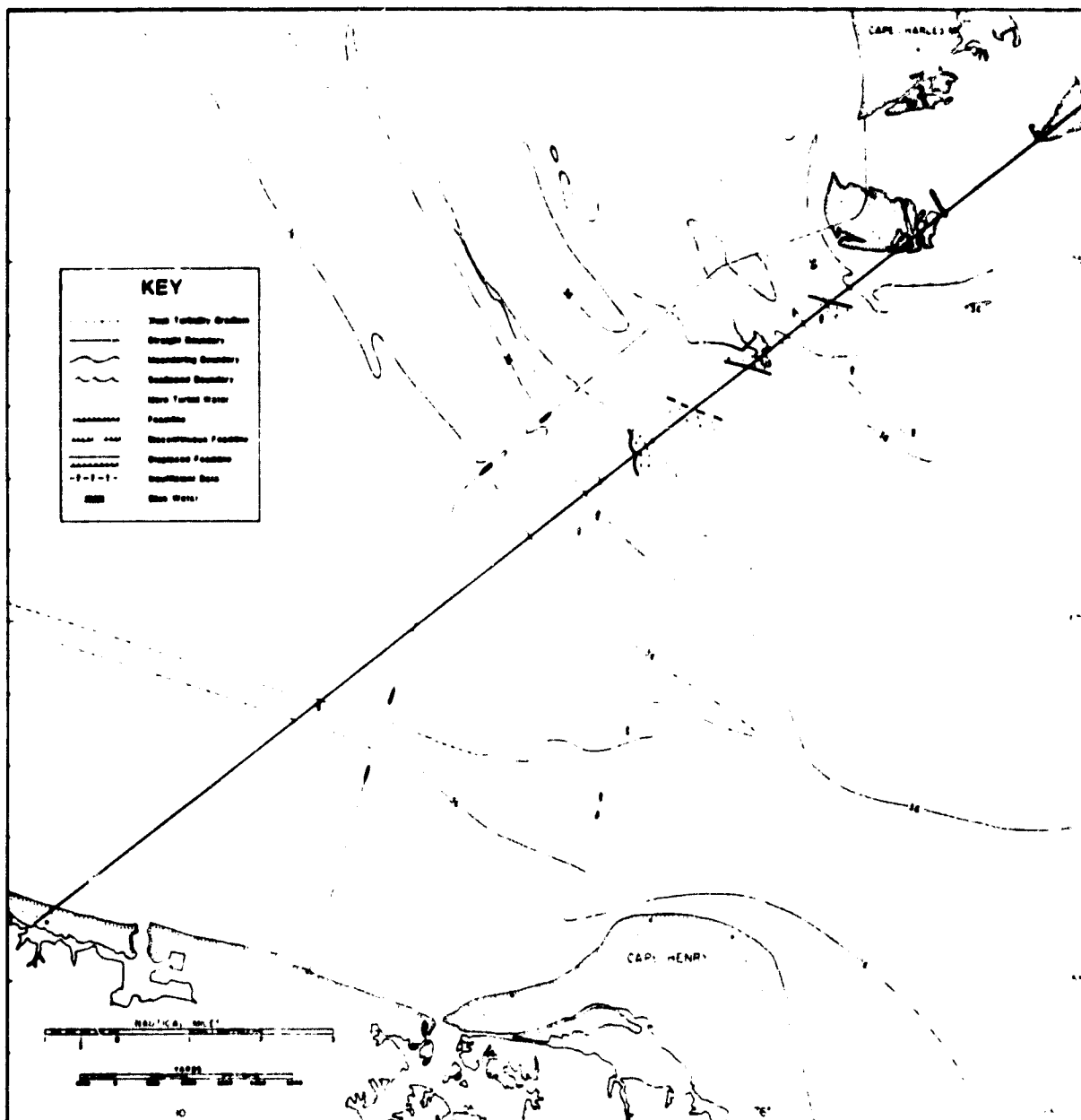
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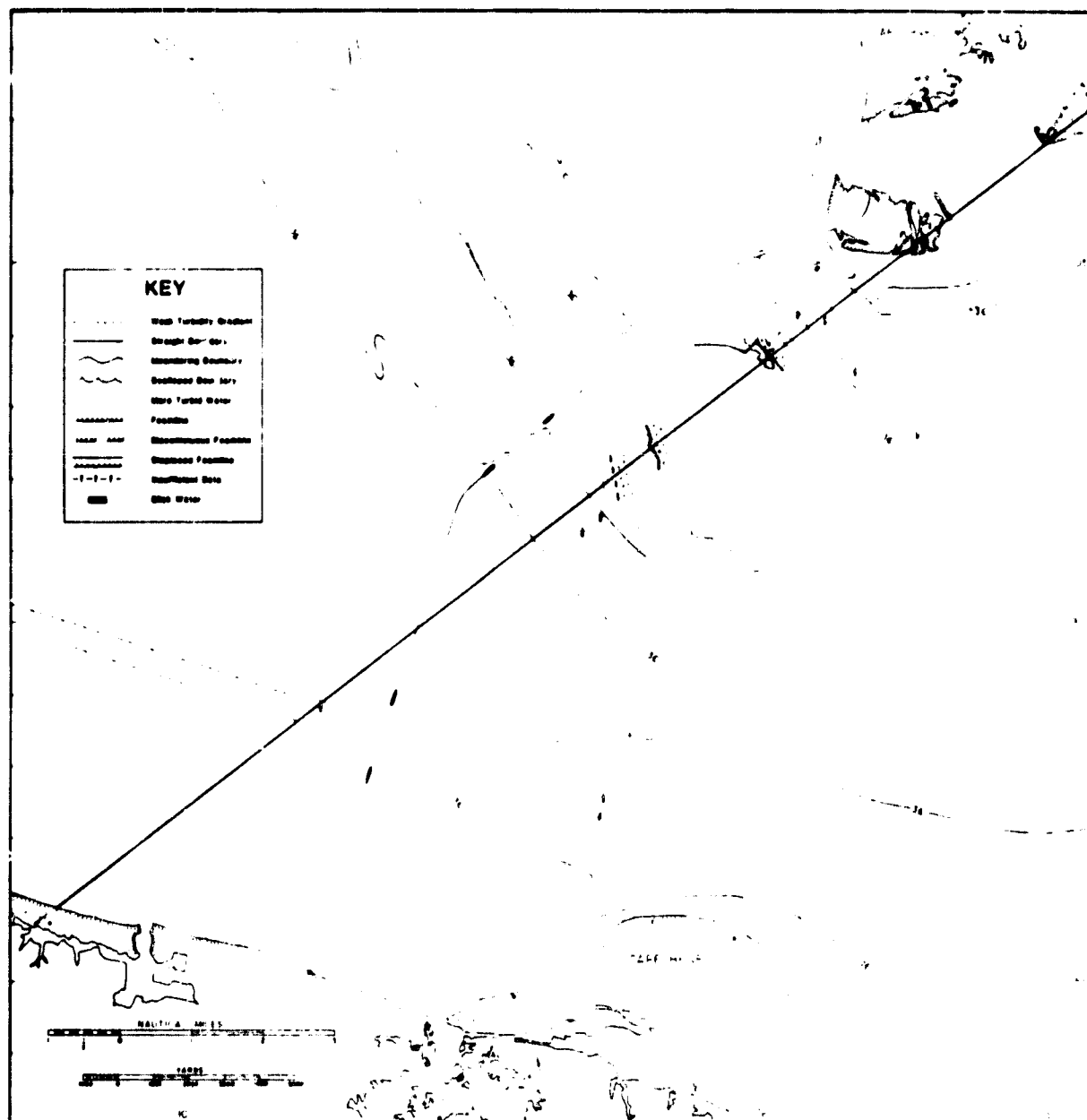
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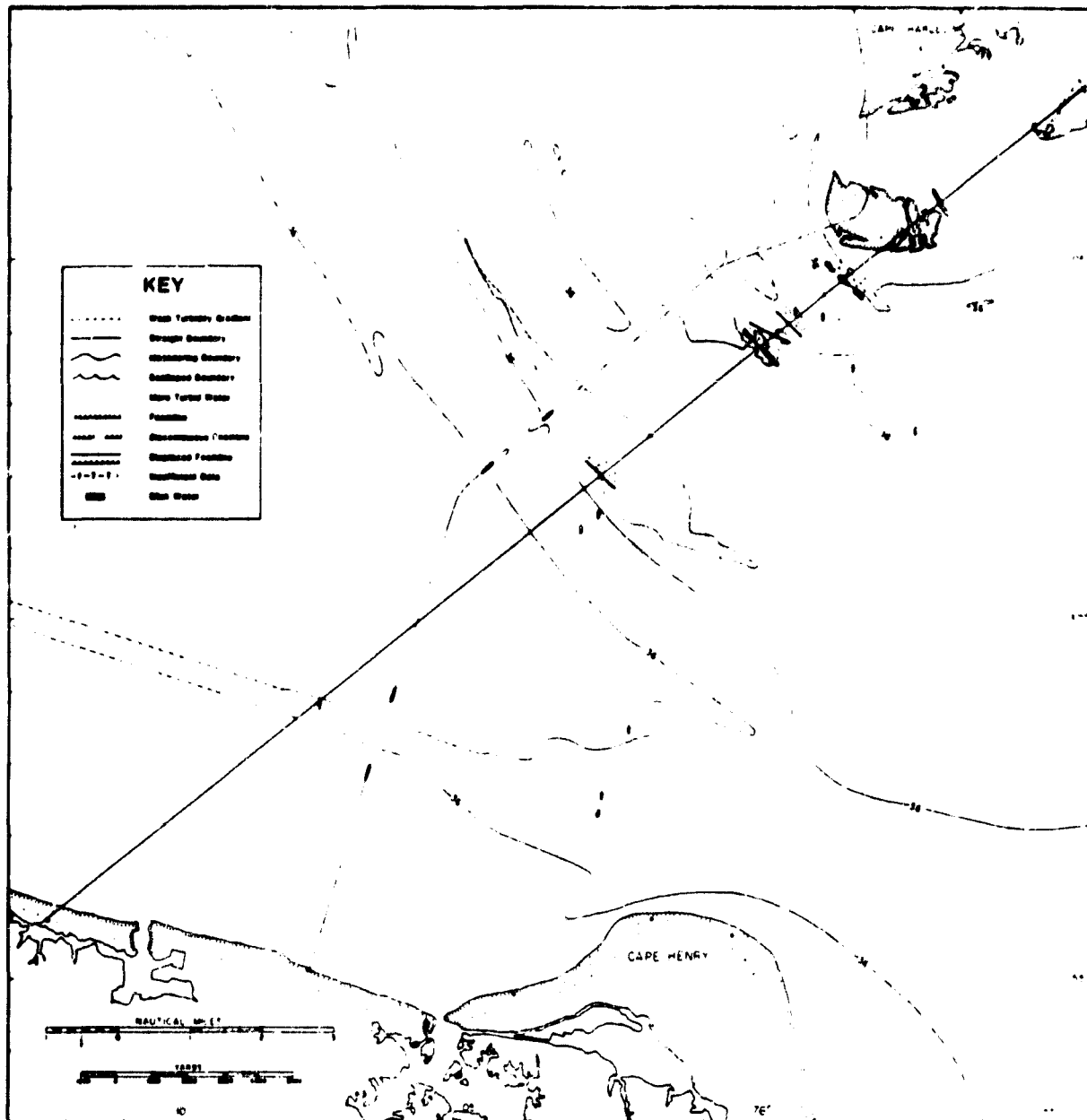
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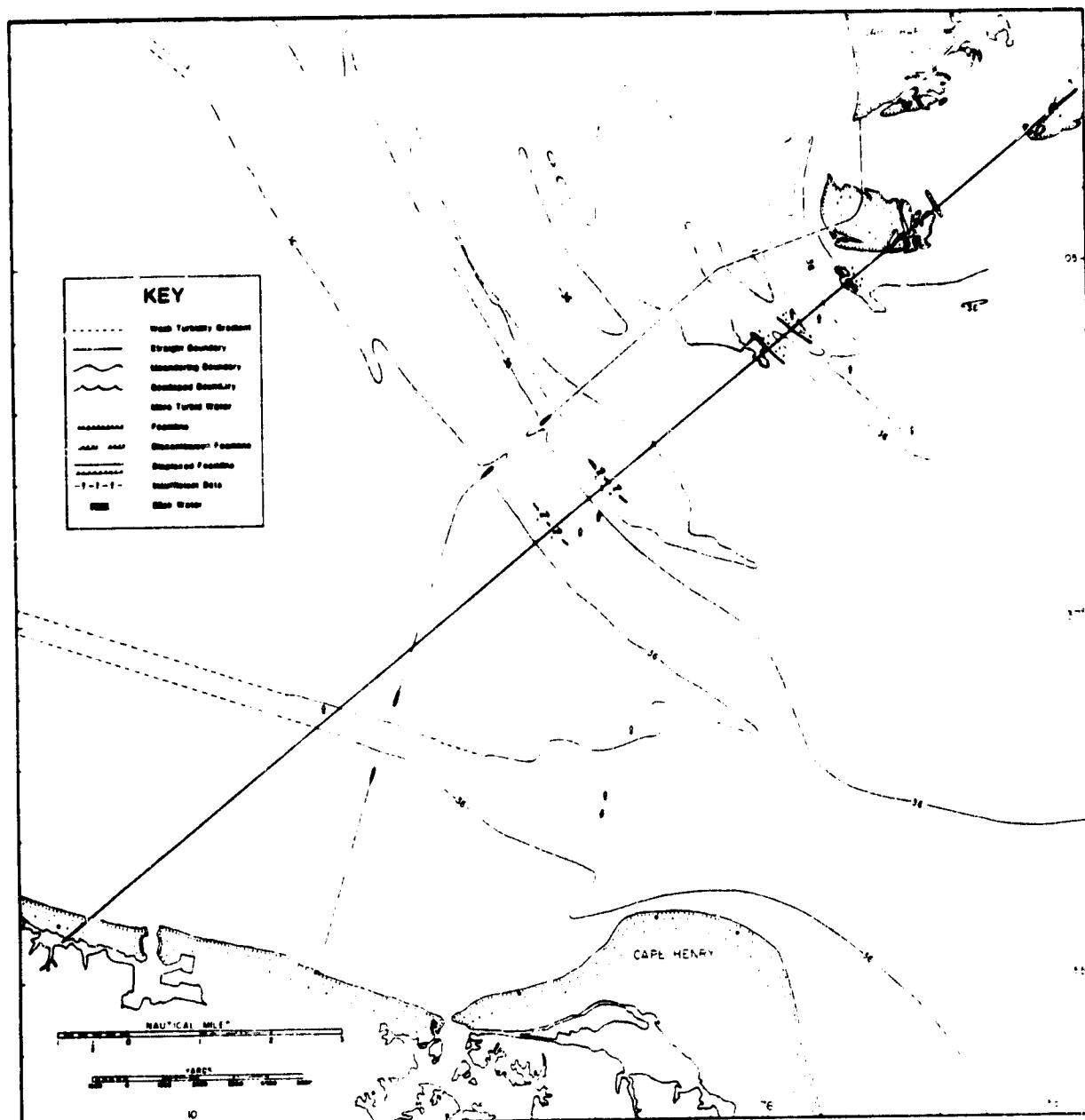
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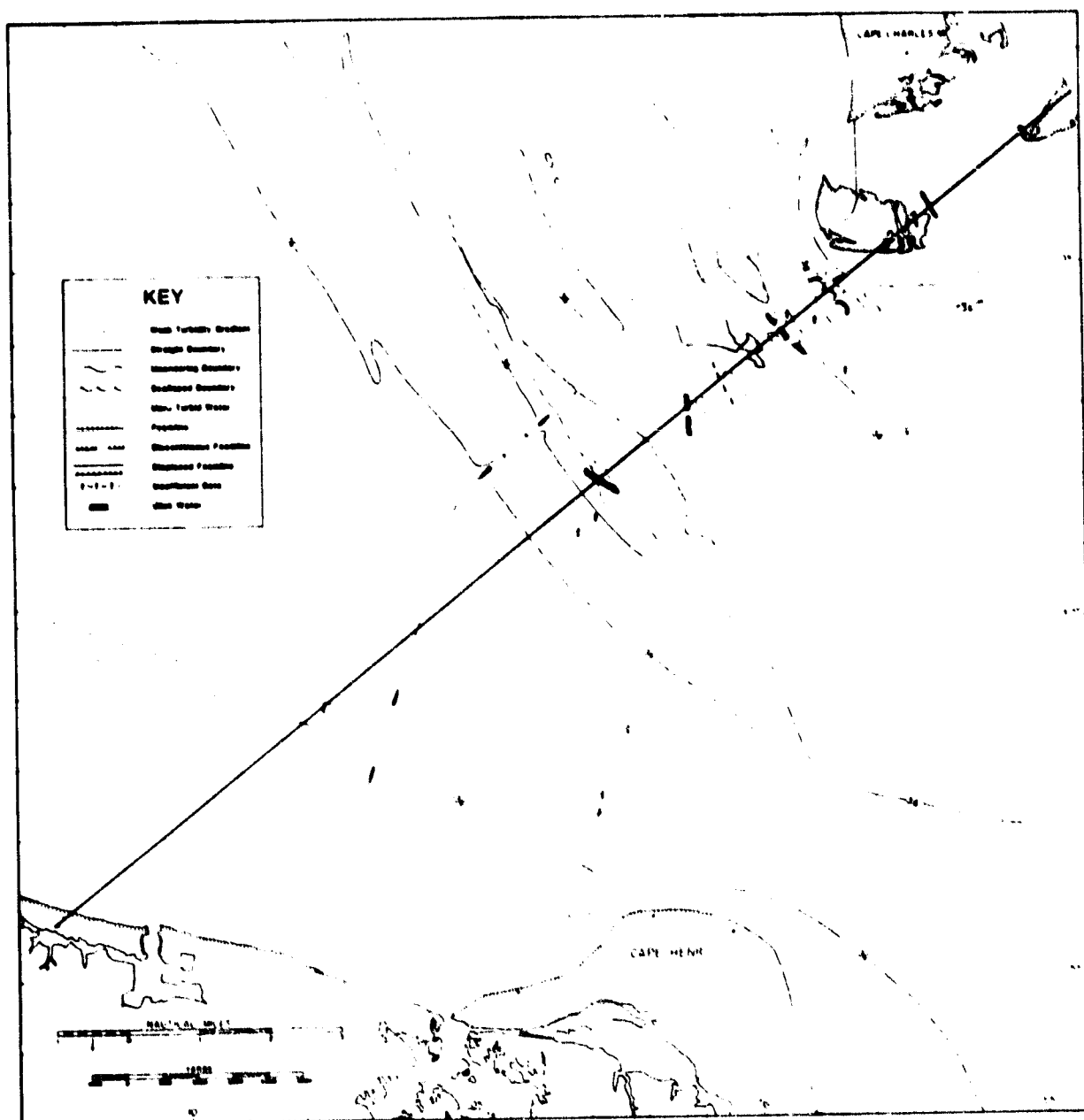
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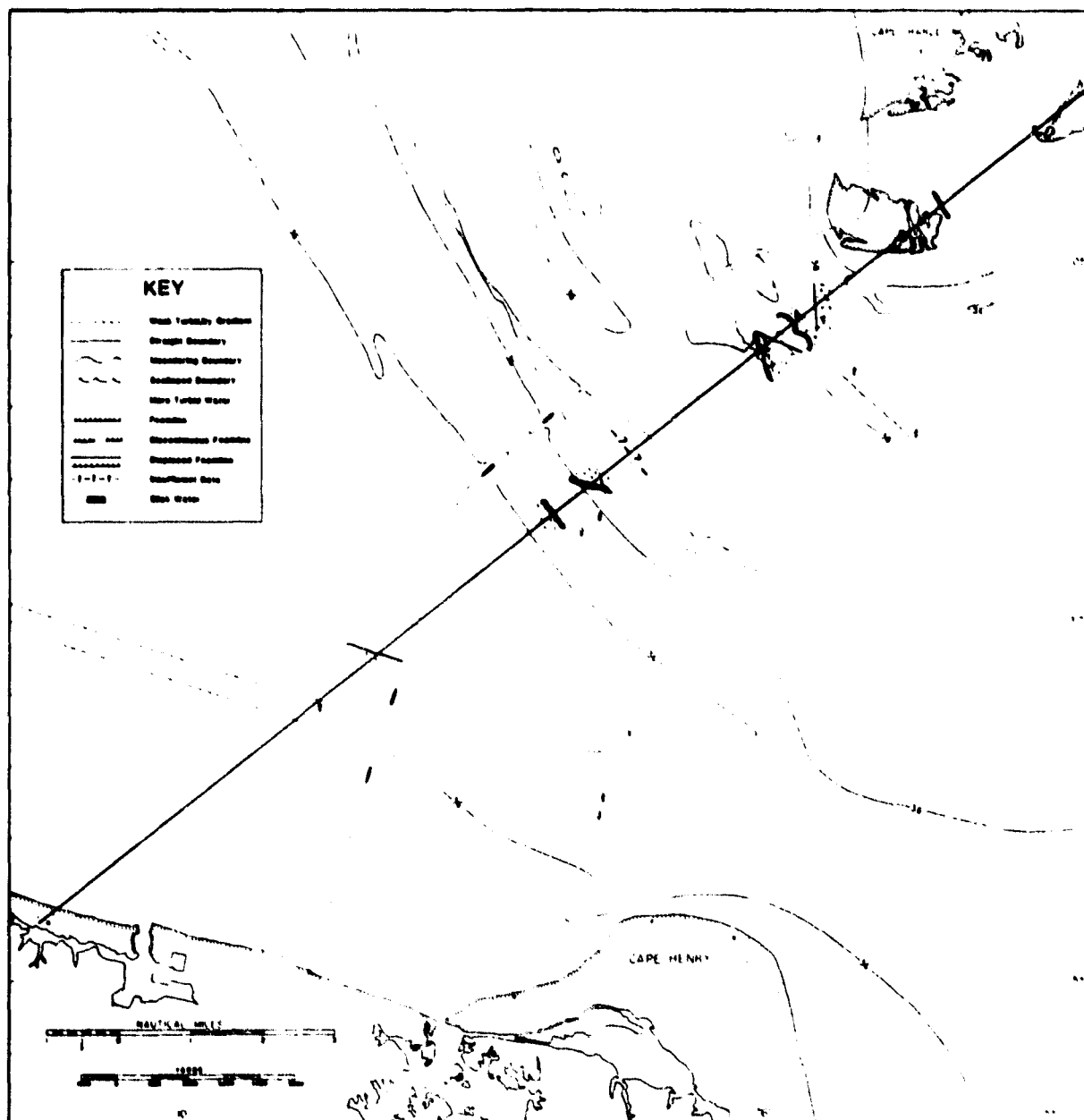
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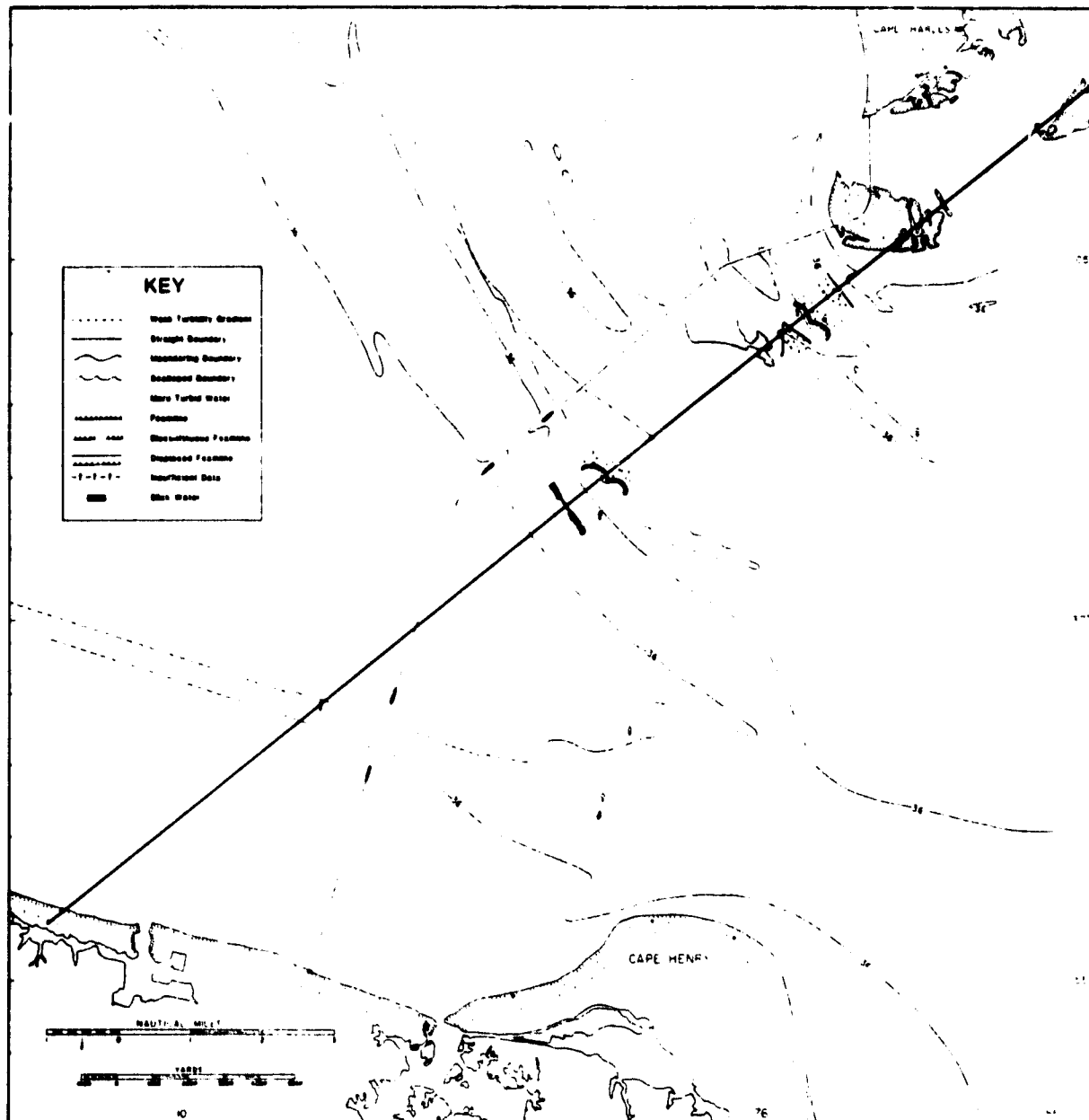
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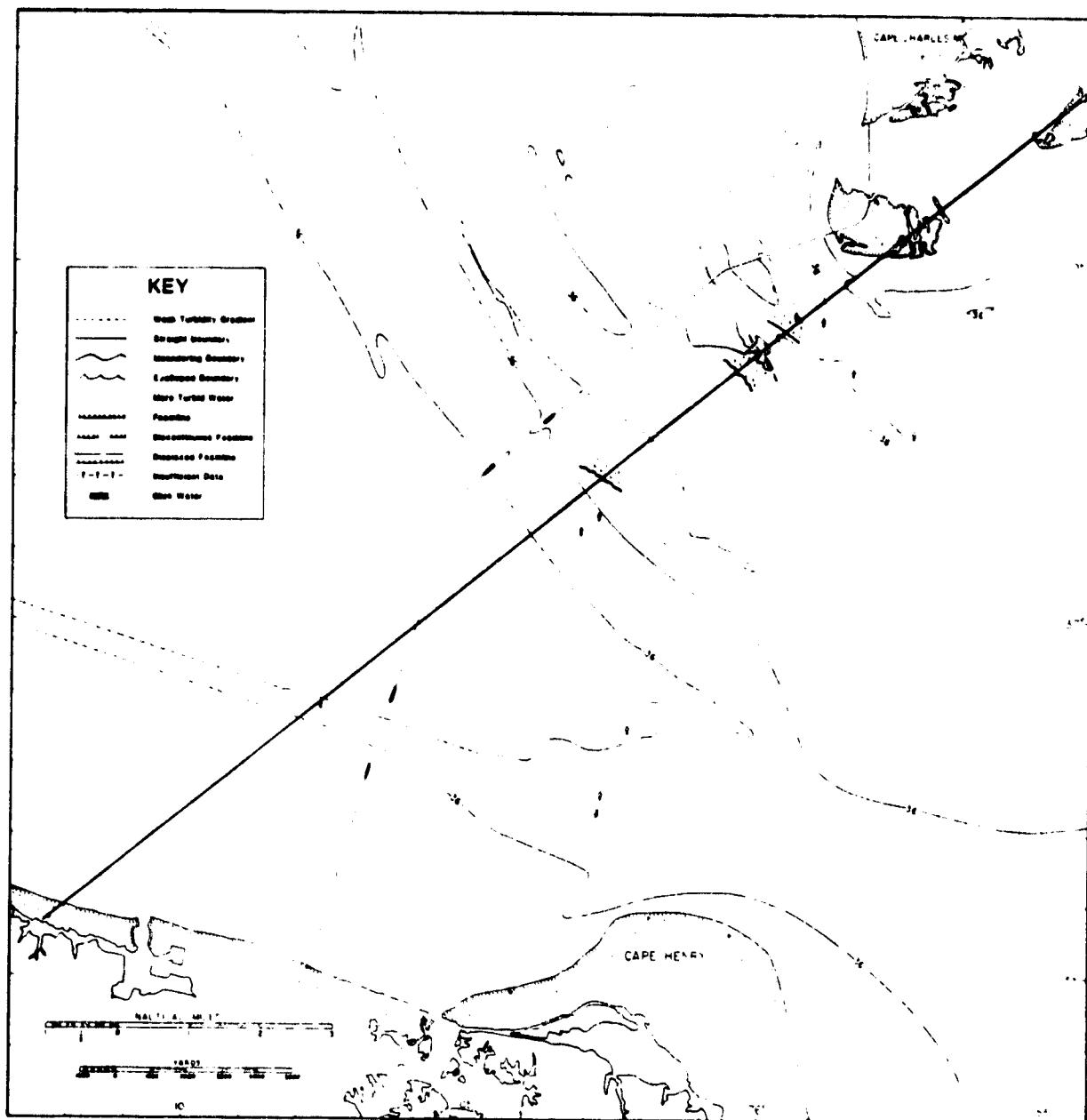
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APPENDIX D
DATA ARCHIVE FILE

Film data is archived in a user file at the Department of Oceanography at Old Dominion University. These data include:

- (1) Six rolls of 35-mm color film, each 100-feet long, covering the entire mission;
- (2) Nine rolls of 70-mm infrared film, each 20-feet long, covering the drift card portion of the study; and
- (3) Nineteen VHS cassettes of closed-circuit television coverage of the entire mission (nine cassettes looking downward, 10 cassettes looking upward, 10 cassettes looking to the right of the flight line).

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